

Exhibit 14
Deposition of Zachary Hall
February 10, 2017

Page 1

STATE OF NORTH CAROLINA) IN THE GENERAL COURT OF JUSTICE
) SUPERIOR COURT DIVISION
MECKLENBURG COUNTY) 13-CVS-11032

STATE OF NORTH CAROLINA ex rel.)
NORTH CAROLINA DEPARTMENT OF)
ENVIRONMENTAL QUALITY,)
) DEPOSITION OF
Plaintiff,)
) ZACHARY SCOTT HALL
vs.)
) February 10, 2017
SIERRA CLUB WATERKEEPER ALLIANCE,) 9:36 A.M.
SOUND RIVERS, WINYAH RIVERS)
FOUNDATION, ROANOKE RIVER BASIN) Charlotte, NC
ASSOCIATION, and CAPE FEAR RIVER)
WATCH, INC.,)
Plaintiff-Intervenor,)
) vs.)
) DUKE ENERGY PROGRESS, LLC.,)
Defendant.)

STATE OF NORTH CAROLINA) IN THE GENERAL COURT OF JUSTICE
) SUPERIOR COURT DIVISION
MECKLENBURG COUNTY) 13-CVS-14661

STATE OF NORTH CAROLINA ex rel.)
NORTH CAROLINA DEPARTMENT OF)
ENVIRONMENT AND NATURAL RESOURCES,)
Plaintiff,)
) vs.)
) CATAWBA RIVERKEEPER FOUNDATION)
INC., APPALACHIAN VOICES, YADKIN)
RIVERKEEPER, MOUNTAINTRUE, DAN)
RIVER BASIN ASSOCIATION, ROANOKE)
RIVER BASIN ASSOCIATION, SOUTHERN)
ALLIANCE FOR CLEAN ENERGY, and)
WATERKEEPER ALLIANCE,)
Plaintiff-Intervenor,)
) vs.)
) DUKE ENERGY CAROLINAS, LLC,)
Defendant.)

A P P E A R A N C E S

For the Plaintiff-
Intervenors:

Ms. Myra Blake
Southern Environmental Law Center
601 West Rosemary Street, Suite 220
Chapel Hill, North Carolina 27516
919-967-1450
mblake@selcnc.org

For the Plaintiff:

Mr. Francisco Benzoni
North Carolina Department of
Justice
Environmental Division
Post Office Box 629
114 West Edenton Street
Raleigh, North Carolina 27602
919-716-6600
tbenzoni@ncdoj.gov

For the Defendant:

Ms. Melissa Romanzo
Hunton & Williams, LLP
Bank of American Plaza, Suite 3500
101 South Tryon Street
Charlotte, North Carolina 28230
704-378-4783
mromanzo@hunton.com

* * * * *

TABLE OF CONTENTS

	By	Pages
Examination	Ms. Blake	5 - 85
Examination	Mr. Benzoni	85 - 90
Examination	Ms. Romanzo	90 - 92

* * * * *

Page 3

E X H I B I T S

Plaintiff's		Page
Number	Description	Reference
DeNeale 1	(Previously entered in the DeNeale deposition.)	6
DeNeale 2	(Previously entered in the DeNeale deposition.)	6
1	2015 Water Quality Report City of Eden	59
2	Letter to DEQ from Reginald Anderson Dated 10/25/16 Re: Belews Creek Bromide Reduction Evaluation Semi- Annual Report	63
3	EPA National Primary Drinking Water Regulations	66
4	E-Mail Chain	68
5	Summary of Bromide Issues in the WSRO 12/6/11	68

* * * * *

This is the transcript of the deposition of ZACHARY SCOTT HALL, being taken by Notice issued by counsel for the Plaintiff/Intervenor, by consent of counsel for the parties and in accordance with the North Carolina Rules of Civil Procedure before Rebekah Gervin Creel, Nationally Certified Verbatim Reporter and Notary Public, in the offices of Hunton & Williams, LLP, 101 South Tryon Street, Suite 3500, Charlotte, North Carolina, on the 10th day of February, 2017, beginning at 9:36 A.M.

IT IS FURTHER STIPULATED AND AGREED by and between counsel for the parties that the review and signing of this transcript by the witness is hereby reserved.

* * * * *

1 ZACHARY SCOTT HALL, having produced a government issued
2 identification, was duly sworn and testified as
3 follows:

4 EXAMINATION BY MS. BLAKE:

5 Q. Mr. Hall, my name is Myra Blake; we met a moment
6 ago. I'm an attorney with the Southern
7 Environmental Law Center, and I represent the
8 conservation groups in this matter.

9 A. Okay.

10 Q. And we'll start with some questions to make sure you
11 understand the deposition process.

12 A. Sure.

13 Q. Have you been deposed before?

14 A. No.

15 Q. Have you had the process explained to you by an
16 attorney?

17 A. Yes.

18 Q. You understand you're under oath today?

19 A. I do.

20 Q. And your testimony will have the same effect as if
21 it was given in a courtroom, even though we're not
22 in a courtroom today.

23 A. Yes.

24 Q. And you understand that you need to give verbal
25 responses to my questions instead of nods or

1 gestures because it's being recorded --

2 A. I understand.

3 Q. Okay. And if you don't understand a question that I
4 ask, please just let me know what you don't
5 understand about it so that I can phrase it better.

6 A. Sure.

7 Q. Okay. And is there any reason that you wouldn't be
8 able to give full, complete, and accurate testimony
9 today?

10 A. No.

11 Q. Okay. Do you understand that this is a -- what's
12 known as a 30(b)(6) deposition, and you're giving
13 testimony on behalf of Duke Energy that will bind
14 the company?

15 A. I do.

16 Q. And I'm going to hand you a document that has been
17 introduced in a previous exhibit. This is just
18 Exhibit 1 from the DeNeale Exhibit -- DeNeale
19 deposition exhibit.

20 (WHEREUPON, DeNeale Deposition Exhibit Number
21 1 was presented for identification.)

22 A. Okay.

23 Q. And also Exhibit 2 from the DeNeale deposition.

24 (WHEREUPON, DeNeale Deposition Exhibit Number
25 2 was presented for identification.)

1 A. Okay.

2 Q. Okay. And if you can take a look at DeNeale Exhibit
3 2, which is an e-mail chain.

4 A. Uh-huh (affirmative response).

5 Q. And on the first page of that e-mail chain, do you
6 see that Duke Energy's counsel is putting forward
7 witnesses, and that you're listed to testify on
8 Topic 15 for Duke Energy?

9 A. I do.

10 Q. Okay. And if you could take a look at Topic 15 as
11 it is presented in Exhibit 1 from the DeNeale
12 deposition.

13 A. All right.

14 Q. Okay. And I believe that's on page 4.

15 A. Uh-huh (affirmative response).

16 Q. Topic 15 is, "All factual information regarding
17 contamination of drinking water intakes downstream
18 of the plants including the effectiveness of any
19 efforts to reduce the contamination." Are you
20 prepared to testify about that topic today?

21 A. I am.

22 Q. Okay. What did you do to prepare for your
23 deposition today?

24 A. Well, I talked to Melissa. I talked to Emma. And
25 then I went through kind of my files on the

- 1 particular topic to see what I had.
- 2 **Q. Okay. And did you review any documents in**
- 3 **particular?**
- 4 **A. I did.**
- 5 **Q. Can you describe those documents?**
- 6 **A. So I have an Excel spreadsheet with data points on**
- 7 **it that we have collected with regards to**
- 8 **specifically bromide concentrations.**
- 9 **Q. And is that Excel spreadsheet from a particular time**
- 10 **period?**
- 11 **A. It's updated as we collect new data, so it's**
- 12 **ongoing.**
- 13 **Q. And when did it first -- how far back does it go?**
- 14 **A. To the time that we signed the plea agreement, so**
- 15 **summer of 2015.**
- 16 **Q. And does the Excel spreadsheet have a name or --**
- 17 **A. You know, I called it my bromide update spreadsheet.**
- 18 **It doesn't have a particular name.**
- 19 **Q. Okay. And does it cover multiple sites or areas?**
- 20 **A. It does.**
- 21 **Q. Which areas does it -- which sites does it cover?**
- 22 **A. Yeah. It's -- so it's -- it covers the Catawba**
- 23 **River Basin, the Dan River Basin. And then limited**
- 24 **data from the French Broad and the Broad Basins.**
- 25 **Q. Okay. And did you review any other documents in**

1 **your files?**

2 A. I did.

3 **Q. Tell me about those documents.**

4 A. I reviewed discharge permits from Belews Creek Steam
5 Station.

6 **Q. Is that the NPDS permit?**

7 A. It is; NPDES permit.

8 **Q. DES. Thank you. And is that -- did you review the**
9 **current permit or previous versions of it?**

10 A. The current permit.

11 **Q. Any other documents?**

12 A. No.

13 **Q. And about how much time did you spend preparing for**
14 **your deposition?**

15 A. Probably a couple of days.

16 **Q. Okay. And did you speak with anyone else besides**
17 **counsel about your deposition?**

18 A. I did.

19 **Q. Who was that?**

20 A. I spoke with Bill Kennedy.

21 **Q. And who's Bill Kennedy?**

22 A. Bill is an engineer in our strategic engineering
23 group at Duke Energy.

24 **Q. And what are his responsibilities?**

25 A. He has responsibility for water treatment, for water

1 that is being discharged from Duke Energy coal
2 facilities.

3 Q. Okay. And is he the individual at Duke with primary
4 responsibility for that or are there others as well?

5 A. There are others, but he's the primary one.

6 Q. And what were your discussions with Mr. Kennedy?

7 MS. ROMANZO: I'm going to instruct you not to
8 reveal those. It was a meeting with
9 counsel where Mr. Kennedy was present to
10 help prepare.

11 MS. BLAKE: Okay.

12 Q. Did you meet with anyone else?

13 A. No.

14 Q. Did you speak with anyone else over the phone in
15 preparing for your deposition?

16 A. No.

17 Q. And what is your position at Duke Energy?

18 A. I am director of environmental science for Duke
19 Energy.

20 Q. And how long have you had that position?

21 A. As a department, we reorganized at the end of 2014.
22 I've had that position since January of 2015.

23 Q. And what are your duties as director of
24 environmental science?

25 A. Sure.

1 MS. ROMANZO: And just to clarify, since this
2 isn't covered by a topic this would be
3 his individual opinion about these
4 questions.

5 MS. BLAKE: Right. Of course.

6 A. Okay. So I have the water resources group. So
7 aquatic ecosystem health, surface water quality,
8 those surface water chemistry. Those type of
9 things. I have the natural resources group,
10 terrestrial rare, threatened, and endangered
11 species. Those type of issues. And I have the
12 corporate or in-house analytical chemistry
13 laboratory. So those three groups are in my
14 organization.

15 Q. Okay. And what was your -- were you at Duke prior
16 to January of 2015?

17 A. I was.

18 Q. What was your position before that?

19 A. I managed the analytical chemistry laboratory.

20 Q. And when did that position start?

21 A. I was hired to do that, that was in the fall of
22 2012.

23 Q. Okay. And would contamination of downstream
24 drinking water intakes, would that fall under the
25 purview of the surface water quality group or other

1 groups as well?

2 A. That's correct.

3 Q. It would be the --

4 A. It would be --

5 Q. -- surface water quality?

6 A. -- the water resources organization.

7 Q. Okay. Thank you for that.

8 A. Uh-huh (affirmative response).

9 Q. So going back to your testimony on behalf of Duke
10 Energy now. Switching gears. Have discharges from
11 Duke Energy's coal ash basins caused or contributed
12 to any contamination of downstream drinking water
13 intakes?

14 MS. ROMANZO: Objection to form. You can
15 answer.

16 A. Okay. What do you mean by contamination? Can you
17 kind of explain the question a little more, please?

18 Q. So contamination meaning any constituent of concern.

19 A. So with regards to bromides, we have shown an impact
20 at downstream drinking water intakes, but that's the
21 only constituent that I know that would have shown
22 any impact.

23 Q. Okay. And are those bromide impacts caused or
24 contributed to by any of Duke Energy's ash basins?

25 MS. ROMANZO: Objection to form.

1 A. So not the ash basin itself, but plant operations do
2 contribute bromides to the rivers in which we
3 discharge into.

4 Q. Okay. And is that true at the Belews site?

5 A. It is.

6 Q. And at the Allen site?

7 A. It is.

8 Q. And at the Cliffside site?

9 A. It is.

10 Q. And at the Marshall site?

11 A. It is.

12 Q. And at the Mayo site?

13 A. It is.

14 Q. And last one, at the Roxboro site?

15 A. It is.

16 Q. Okay. And when you say ash basin -- or I believe
17 you said plant operations contribute to the presence
18 of bromide. Can you describe how that works?

19 MS. ROMANZO: Objection to form.

20 A. Sure. So bromide is naturally present within the
21 coal that's combusted at the plant itself. So the
22 bromides that are naturally present within the coal
23 go through the combustion process. They are pulled
24 out of the flue gas by the FGD system, the flue gas
25 desulfurization system. And then they are present,

1 bromides are present in the FGD blowdown, the
2 wastewater that comes from the FGD scrubber. That
3 is then discharged into the ash basin. Bromides are
4 very soluble so they're present within the water
5 within the ash basin, and then they are ultimately
6 discharged through our outfalls.

7 **Q. Okay. So they're discharged from the ash basin**
8 **through --**

9 A. That's correct.

10 **Q. -- the outfalls?**

11 A. That's correct. I'd like to point out too there's
12 no regulatory limit for bromides. They are not, in
13 and of themselves, a dangerous compound that can
14 harm humans, at least not in the quantities that
15 we're talking about. And they're not on, aside from
16 Belews Creek, they're not listed on any of our NPDES
17 permits.

18 **Q. And when you say listed on the permits --**

19 A. We're not required -- we're not required to monitor
20 bromides outside of Belews Creek of which there's a
21 monitor and report. There's not a limit.

22 **Q. Okay. And does that monitoring at Belews Creek**
23 **occur at the outfall or in the river?**

24 A. It occurs at the outfall.

25 **Q. Okay. So there's no in-stream monitoring of bromide**

1 **at the Belews site?**

2 A. Not at Belews Creek.

3 **Q. Okay. Is there any in-stream --**

4 A. When you say -- let me get a clarification there.
5 What do you mean by "in-stream"?

6 **Q. In the receiving surface water.**

7 A. Okay. So by in-stream, I thought you meant within
8 the plant itself.

9 **Q. I see.**

10 A. So there -- I do have data. We have collected data.
11 Belews ultimately discharges to the Dan River and we
12 do have data within the Dan River.

13 **Q. And where is that data collected in the Dan River?**

14 A. There are -- I think, there are five points, Myra,
15 that we routinely collect bromide data. One is
16 upstream of Belews Creek itself. So we know
17 concentrations in the water that we intake because
18 there are other anthropogenic sources of bromide out
19 there. Not being a regulated constituent, it's
20 tough to get your arms around who's discharging
21 bromide. It's not on anybody's NPDES permit.
22 So in order to identify, you know, kind of those
23 other anthropogenic sources, you know, we look
24 upstream to see what's coming -- what's coming in.
25 We have a sampling point at the town of Madison,

1 which is immediately downstream of the Belews Creek
2 discharge. I think river miles -- again, I'm
3 speculating here -- but it's between probably 10 and
4 15 river miles. We have a monitoring point on a
5 tributary, I think it's called Smith Creek to the
6 Dan. So we know other anthropogenic sources, what's
7 coming in from a loading factor through the
8 tributary. We have a sampling point at the town of
9 Eden, and we have a sampling point after the town of
10 Eden; after their wastewater treatment plant
11 discharge.

12 **Q. Okay. And a few questions about each of those, if**
13 **we can --**

14 **A. Sure.**

15 **Q. -- starting with the upstream sampling location in**
16 **the Dan River. Approximately, how far upstream is**
17 **that upstream location?**

18 **A. It's far enough -- it's about a mile and a half.**
19 **It's far enough to not be influenced by our plant**
20 **operations.**

21 **Q. Okay. And then the sampling point in the Smith**
22 **Creek that you mentioned.**

23 **A. Uh-huh (affirmative response).**

24 **Q. Is that tributary downstream of the Belews discharge**
25 **point or upstream?**

1 A. It's downstream of the Belews discharge point. It's
2 downstream of Madison, but upstream of Eden.

3 Q. Okay. And is there any sampling that occurs
4 downstream of the Belews discharge point anywhere
5 closer than Madison?

6 A. No.

7 Q. Okay. And how long has Duke been sampling at these
8 five locations? Or you can take them one at a time,
9 if you need to.

10 A. Yeah. No. We started them as a group and I'm
11 trying to remember the exact time frame. I just --
12 it's 2011-2012 time frame. So I don't remember
13 exactly, Myra.

14 Q. Okay. And you said that that monitoring of surface
15 waters, that's occurring at Belews only, or is it
16 also occurring at any other sites?

17 A. No, it's occurring at the other sites as well.

18 Q. I see. Okay. Could you walk me through starting
19 with the Allen site?

20 A. So it would probably be easier because Allen's on
21 the Catawba if I walked you through the Catawba.

22 Q. Okay. That's fine.

23 A. Okay. So we sample, again, upstream, so up by the
24 northern reaches of Lake Norman.

25 Q. Okay.

1 A. And then coming down, we sample near the -- near the
2 Mooresville -- city of Mooresville drinking water
3 intake. And we have from Mooresville to Cowans Ford
4 Dam, which is down at the McGuire plant, we have
5 approximately ten different routine monitoring
6 stations on Lake Norman that we routinely collect
7 samples for.

8 Q. Okay.

9 A. So, and that is to gauge impact from our Marshall
10 Steam Station.

11 Q. Okay.

12 A. Okay. So you go through Cowans Ford Dam, then you
13 get to Mountain Island Lake. We have approximately
14 five locations on Mountain Island Lake, one of which
15 is near the city of Charlotte's main drinking water
16 intake. And we -- you know, we set these up to
17 characterize concentrations within the basin, but
18 also at the municipal drinking water intakes. Okay.

19 So then getting into -- on down the Catawba
20 River, so past the Mountain Island Dam, we have, in
21 Lake Wylie -- we have approximately five locations
22 in Wylie itself that captures potential impacts from
23 Allen Steam Station. And then we also have one
24 sampling point in the south fork of the Catawba
25 upstream in the south fork, so.

1 Q. So upstream of the Allen site?

2 A. Upstream of the Allen site, yeah. If you're
3 familiar with the geography, kind of the way it
4 looks, so --

5 Q. Okay. And so that covers --

6 A. That covers the Catawba.

7 Q. The Catawba, so the Allen, and the Marshall site,
8 and Riverbend too?

9 A. Yeah.

10 Q. And then what about in the French Broad?

11 A. So a kind of paucity of data there. We have one
12 sampling event, and that was downstream. That was
13 -- let's see -- probably four locations downstream
14 of our Asheville site.

15 Q. Okay. And any upstream sampling --

16 A. We did collect an upstream there as well, yeah.

17 Q. And it was just one sampling event, though?

18 A. Just one.

19 Q. And how about sampling around the Cliffside site?

20 A. We have approximately -- I'd say four or five events
21 of five locations upstream. One upstream and five
22 locations downstream of Cliffside.

23 Q. Okay. And how far downstream do those extend?
24 What's kind of the range?

25 A. So we sampled -- we stopped sampling points with the

1 -- and where we stopped with the claims process
2 notification. So for -- I mean, we can go over each
3 one of them -- but from -- and on the Catawba, we go
4 down to the Wateree Reservoir, which is the
5 Lugoff-Elgin -- near the Lugoff-Elgin area. On the
6 Dan, we go to the Kerr Reservoir. On the French
7 Broad, we go through kind of a -- the North
8 Carolina-Tennessee line, it flows to kind of the
9 northwest. And on the Broad, we go to -- we went to
10 approximately Columbia.

11 **Q. Okay. And you mentioned a term I'm not familiar**
12 **with, the "claims process notification." What is**
13 **that?**

14 **A.** Yeah. So as part of our plea agreement that was
15 signed in 2015 with the Department of Justice, there
16 was a stipulation in that that we establish a
17 process by which municipalities that are downstream
18 of our scrubbed operations can file a claim for
19 damages, and that claim will be evaluated by the
20 court-appointed monitor.

21 **Q. Okay.**

22 **A.** So those notifications went out in April of 2016.

23 **Q. So the notifications to the municipalities?**

24 **A.** To the municipalities notifying them of the claims
25 process, yes.

1 Q. And have any claims come in from municipalities
2 since that time?

3 A. No.

4 Q. And you said the notification went out in --

5 A. April of -- April of last year.

6 Q. Okay. And then did we cover -- could you describe
7 the sampling locations near the Roxboro and Mayo
8 sites?

9 A. Sure. So those sites ultimately discharge to the
10 Dan. So we collected a few samples. Not on our
11 routine monitoring plan that I described earlier.
12 But we collected a few samples downstream near the
13 headwaters of the Kerr Reservoir where, after the
14 discharges from those two plants flow into the Dan
15 so that's where we collected those particular
16 samples.

17 Q. Okay.

18 A. Yeah.

19 Q. And approximately what time frame was that?

20 A. This all started after the signing of the plea
21 agreement. So the routine stuff has been on since
22 2011, 2012. But the stuff that I kind of just
23 described with some of the other specialized sample
24 locations started after the signing of the plea
25 agreement so that was May of 2015.

1 Q. Okay. And when you say the "routine sampling," does
2 that include the sampling on the Dan River near the
3 Belews site?

4 A. It does. Yeah, those are routine sampling points.

5 Q. Were any of the other sampling points routine?

6 A. There was one or two on the Broad. And
7 approximately 12 of the sampling points on the
8 Catawba were kind of part of our routine sampling
9 requirements.

10 Q. And how often are the routine samples collected?

11 A. Generally, quarterly.

12 Q. Okay.

13 A. But they can vary depending on need.

14 Q. Okay.

15 A. So, but, generally quarterly.

16 Q. And are the samples taken at the -- for the routine
17 samples -- at the same location every time, like --

18 A. So those locations are included. I mean, the
19 purpose of those samples is different than the
20 purpose of characterizing bromide concentrations.
21 So they're included, because on that river, we're on
22 that reservoir so we include those at the same time
23 that we collect these others as well.

24 Q. Sorry. I think I got a little lost there. I was
25 just asking for the routine samples. Are they

1 collected at the same spot on the river, the same
2 GPS location?

3 A. The exact same spot every time we go, yes.

4 Q. And what was your point about the inclusion of
5 those?

6 A. So, they are collected for a different purpose, so
7 our routine samples are collected for a different
8 purpose. But we fold that into the purpose of
9 trying to characterize bromide concentrations,
10 right? So you're not going to make separate trips,
11 so.

12 Q. Okay. And so for the routine samples you're also
13 sampling for other constituents; is that right?

14 A. That's correct.

15 Q. And how are those other constituents determined or
16 is it something in the permit or --

17 MS. ROMANZO: Objection to form.

18 A. So, generally, they are, again, to support other
19 regulatory purposes, whether it's a 316(a), a
20 thermal discharge variance, something like that. So
21 they are in study plans that have been submitted to
22 DEQ and the parameters are laid out in there. But
23 they're in support of other regulatory obligations.

24 Q. Okay. And so would you look to those study plans to
25 see the specific locations where the testing occurs?

- 1 A. They would be in there, yes.
- 2 Q. And are the results of the routine testing submitted
3 to DEQ?
- 4 A. On an annual basis.
- 5 Q. Okay. And that includes the results for bromide in
6 particular?
- 7 A. The bromides aren't required as part of those other
8 regulatory obligations, so they would not be
9 included.
- 10 Q. So they would be included in the sampling, but not
11 in the submission to --
- 12 A. That's correct.
- 13 Q. -- DEQ?
- 14 A. That's correct.
- 15 Q. Okay. And how about for the nonroutine sampling
16 events that you discussed, would those have been --
- 17 A. There's no regulatory obligation. Remember there's
18 no -- there's no standard for bromide. So outside
19 of the Belews Creek discharge, which has been
20 submitted on the DMRs as a monitoring report.
- 21 Q. Okay. So at Belews, the samples that are taken at
22 the pipe are submitted to DEQ?
- 23 A. They are submitted.
- 24 Q. Okay.
- 25 A. The samples that we have collected in the Dan are

1 not.

2 Q. Okay.

3 A. Those data are not submitted.

4 Q. Okay. Thank you for that. I might have a few more
5 questions --

6 A. Sure.

7 Q. -- if I think of them later, but I think I
8 understand the general picture.

9 A. Sure.

10 Q. Hang on just a moment. Okay. I believe you
11 mentioned some of the drinking water intakes that
12 are downstream of the Belews site. Could you just
13 kind of list out those for me to make sure I have
14 them all?

15 A. Yeah. Let me see if I can remember them all. So
16 there's Madison.

17 Q. Okay.

18 A. There's the town of Mayodan; M-a-y-o-d-a-n.

19 Q. Okay.

20 A. There's the town of Eden. There is Danville,
21 Virginia.

22 Q. Okay.

23 A. There is South Boston, Virginia, and then the Dan
24 kind of turns back to the south, comes back into
25 North Carolina, and there is a multimunicipality

1 intake called the Kerr Lake regional water intake,
2 you know, something along those lines. But those
3 are the ones downstream of Belews that were notified
4 as part of the claims process.

5 **Q. I see. Okay. And have there been any bromide**
6 **concerns at the Mayodan water intake?**

7 MS. ROMANZO: Objection to form.

8 A. Not that -- not at the Mayodan, that I'm aware of.

9 **Q. Any at the Danville water intake?**

10 A. Yes.

11 **Q. Okay. Any at the South Boston?**

12 A. Not that I'm aware of.

13 **Q. And how about the Kerr Lake regional water intake?**

14 A. Not that I'm aware of.

15 **Q. Okay. And are there any -- or what are the drinking**
16 **water intakes that are downstream of the Allen site?**

17 A. You know, I'm not going to remember each one of
18 them. They're spelled out in the claims process in
19 the -- it's available on a publicly available
20 website, but it's Rock Hill, and then once you go
21 through Wylie Dam there's Camden and there's a
22 Lugoff-Elgin.

23 **Q. Okay.**

24 A. And I may be missing one, but that's the three that
25 I know of that are downstream of Allen.

- 1 Q. And any downstream of Cliffside?
- 2 A. Yes.
- 3 Q. Okay.
- 4 A. Shelby. Gaffney. At the very end it's Columbia,
5 and then there's one more in between Gaffney and
6 Columbia, and I'm sorry, Myra, I can't remember
7 exactly which one that is right now either.
- 8 Q. Okay. That's fine. And you said that these are
9 also listed in a document?
- 10 A. They are, yeah. They're in -- so on Duke Energy's
11 website, there is a bromide section. As part of the
12 plea agreement and the claims process was we had to
13 make that publicly available. So that's available
14 via our website.
- 15 Q. Okay. And that document lists all the downstream --
- 16 A. Yes.
- 17 Q. -- drinking water intakes?
- 18 A. Yes.
- 19 Q. Okay. All right. I apologize that I don't have
20 that document here today.
- 21 A. That's okay.
- 22 Q. Could you list the Marshall downstream drinking
23 water intakes?
- 24 A. Yeah. So there was Mooresville.
- 25 Q. Okay.

1 A. Let me just kind of go down here. There was
2 Charlotte's Intake Number 1, so Rock Hill and
3 Charlotte have two intakes.

4 **Q. Okay.**

5 A. So Charlotte Intake Number 1. Then you go through
6 Cowans Ford Dam, and now you're now on Mountain
7 Island, Charlotte Number 2 intake, which is their
8 main drinking water intake.

9 **Q. Okay.**

10 A. You have the city of Gastonia, you have the city of
11 Belmont, you have the city of Mount Holly. I think
12 that's all.

13 **Q. Okay. And then for the Mayo site?**

14 A. I'm missing -- I'm sitting here thinking I'm missing
15 one on the Catawba between -- but I just -- I'm
16 sorry. I just don't remember right now what it is.

17 **Q. Okay.**

18 A. So with Mayo and Roxboro discharging into the Dan,
19 it's the same municipalities that were for Belews
20 Creek.

21 **Q. Okay.**

22 A. There's no municipalities between where they
23 discharge and their entrance into the Dan River;
24 there's no intake. So it would be the same for
25 Belews Creek.

1 Q. Okay. Got it. And is there also a drinking water
2 intake on Mayo Lake that served employees of the
3 Mayo power plant in the past?

4 A. There was, and I don't know if it's still active or
5 not.

6 Q. Okay. Does it sound right to you that it was
7 stopped being used in approximately the 2007 time
8 frame?

9 A. I'd be speculating. I'm sorry.

10 Q. Okay. Is that one of the water intakes that you
11 evaluated as part of the claims process?

12 A. Can we take a second?

13 MS. ROMANZO: Do you have a question about
14 privilege? Otherwise, you need to
15 answer her question.

16 A. No, I don't have a question about privilege. No.
17 It was -- that particular intake was not evaluated
18 in terms of this whole claims process.

19 Q. Do you know why not?

20 A. The agreement -- or the plea agreement specifically
21 stipulated municipal drinking water intakes.

22 Q. I see. Okay. So the water intake on Mayo Lake
23 wasn't a municipal intake. Was it a public intake,
24 water intake?

25 A. I don't know.

1 Q. Okay. Do you know if that water intake on Mayo Lake
2 has or has had any issues related to bromide?

3 MS. ROMANZO: Objection to form.

4 A. I don't know.

5 Q. Okay. And is there a drinking water intake in Hyco
6 Lake for the Roxboro site?

7 A. Not that I'm aware of.

8 Q. I guess for the Roxboro site, in general, is there
9 any drinking water intake, even if it's not directly
10 on Hyco Lake, that pulls from surface waters for the
11 plant?

12 A. Not that I'm aware of.

13 Q. Okay. And I guess for the drinking water intake
14 that either exists or did exist on Mayo Lake, are
15 you aware of any contamination besides bromide in
16 that water intake?

17 A. No.

18 Q. Okay. And so I believe you testified earlier -- and
19 you can always let me know if I get anything wrong
20 about your earlier testimony --

21 A. Sure.

22 Q. -- but the bromide is discharged from the ash basin
23 to surface waters at the sites that we talked about.
24 Does bromide also discharge from seeps from the ash
25 basin into surface waters?

1 MS. ROMANZO: Objection to form. And to the
2 extent you're asking him to testify
3 about a topic that was covered by
4 Shannon Langley's deposition yesterday.

5 Q. Okay. I guess I'm just asking regarding Topic 15,
6 all factual information regarding contamination of
7 drinking water intakes. I'm just asking about the
8 source of or the origins of contamination, so.

9 A. Can you restate the question? I'm sorry.

10 Q. Yes, absolutely. So do discharges of bromide come
11 from seeps from the ash basin in addition to
12 discharges from the pipe at the ash basins?

13 MS. ROMANZO: Objection to form.

14 A. So as far as I'm aware, we have not tested the seeps
15 for bromides. So I wouldn't know.

16 Q. Is there any reason that bromide would not be
17 present in the seeps, that you know of?

18 MS. ROMANZO: Objection to form.

19 A. It would be highly unlikely. And the reason why, is
20 bromides are extremely soluble. So they're a very,
21 very soluble compound. So they -- in order to be
22 present within the seeps, they would have to be
23 present within the ash. And the solubility dictates
24 that they would be present within the basin waters
25 themselves and not the ash.

1 Q. Are you familiar with the layout of the Belews Creek
2 site and the discharge --

3 A. Vaguely.

4 Q. Okay. Well, I'll try to go through it without a
5 map. I don't necessarily have one handy at this
6 moment. But let me know if it would be -- if it's
7 necessary to --

8 A. Sure.

9 Q. -- see a map. But are you aware that the pipe
10 leading out of the ash basin at Belews Creek comes
11 out on the -- sort of the northwest side of the ash
12 basin and then discharges into the tributary of the
13 Dan River?

14 MS. ROMANZO: Objection to form.

15 A. Uh-huh (affirmative response).

16 Q. I'm sorry. Was that a "Yes"?

17 A. That was a "Yes."

18 Q. Okay. And so the pipe intersects that tributary,
19 you know, approximately halfway down or so; is that
20 your understanding?

21 MS. ROMANZO: Objection to form.

22 Q. Or discharges under that tributary approximately
23 halfway down the tributary?

24 MS. ROMANZO: Same objection.

25 A. It could be, yeah; yes.

1 Q. Okay. And there's at least some space where seepage
2 and flow of the tributary occurs that's upstream of
3 the pipe but downstream of the ash basin; is that
4 right?

5 MS. ROMANZO: Objection to form.

6 A. I'm sorry. I don't know the location of the seeps.

7 Q. Oh, okay.

8 A. If that's what you're asking.

9 Q. I guess, without getting into the location of the
10 seeps, there is water that emerges from the ash
11 basin upstream of the pipe but coming from the ash
12 basin; is that right?

13 MS. ROMANZO: Objection to form. And this was
14 covered yesterday by Shannon Langley's
15 deposition in great detail.

16 MS. BLAKE: And I just am getting into this
17 because Mr. Hall testified that it was
18 unlikely that there was bromide in the
19 seepage, and I want to ask him about
20 some facts that appears to be contrary
21 to that. So I'm just laying the context
22 for that.

23 MS. ROMANZO: Sure. Well, to the extent
24 you're asking about the locations of
25 seep or surface water, that was covered

1 by Shannon Langley's deposition. So if
2 he knows, he can tell you in his
3 personal capacity.

4 MS. BLAKE: Okay.

5 Q. So are you able to answer?

6 A. What's the question?

7 Q. So the question is, are you aware that there is some
8 water that emerges from the ash basin that is
9 upstream of the pipe that comes out of the ash
10 basin?

11 A. No, I was not aware.

12 Q. Okay. And are you aware that tests in that water
13 have shown, in that particular space of water
14 downstream of the ash basin but upstream of the
15 pipe, have shown elevated levels of bromide?

16 A. No.

17 MS. ROMANZO: Objection to form.

18 Q. Okay. That's not something you have evaluated?

19 A. As I stated earlier, we have not looked at bromide
20 concentrations from seeps, so we have not evaluated
21 that.

22 Q. Okay. Or seeps or this particular surface water
23 that's upstream of the pipe?

24 MS. ROMANZO: Objection to form. Also, to the
25 extent you're using the word "pipe." I

1 think Mr. Langley testified that there
2 wasn't a pipe, but we would have to look
3 at his testimony about that, so I just
4 wanted to clarify that.

5 Q. Okay. So, I mean, I think we may disagree about
6 that but from the -- at least from the point where
7 the discharge from the pipe or other structure from
8 the ash basin discharges into this tributary of the
9 Dan River. And the question was have you evaluated
10 the presence of bromides upstream of that location?

11 A. No.

12 Q. Okay. Does Duke Energy have any plans to test the
13 seeps for bromide?

14 A. No.

15 MS. ROMANZO: Objection to form.

16 Q. So when bromide enters a drinking water intake, does
17 it cause or lead to the formation of
18 trihalomethanes?

19 MR. ROMANZO: Objection to form.

20 A. It can. There are other constituents or causal
21 factors, other halogens. I mean, that's what
22 trihalomethanes are, right? They're a byproduct of
23 overchlorination. So you don't just have the
24 trihalomethane form just solely from bromide. It's
25 -- you have to have -- a big factor is total organic

1 carbon, and then you have to have time. So there's
2 a lot of factors that go into trihalomethane
3 formation.

4 **Q. Okay. But, generally, is bromide -- if bromide is**
5 **present and mixes with chlorine, does that lead to**
6 **trihalomethane formation?**

7 MS. ROMANZO: Objection to form.

8 A. No, not without the other factors. You have to have
9 the -- the carbon has to come from somewhere, you
10 have to have the TOC.

11 **Q. Okay.**

12 A. You have to have time and there's a kinetic or
13 temperature kind of factor in here too. So the
14 warmer the water, the quicker the reaction occurs.
15 So all of that factors in -- in together.

16 **Q. Okay. Are there any other factors that affect the**
17 **formation?**

18 A. That's the reaction, halogens, total
19 trihalomethanes. You have the halogens and you have
20 the carbon, so those -- and then the external
21 factors affecting the reaction, temperature, and
22 time.

23 **Q. And is bromide a type of halogen?**

24 A. It is.

25 **Q. Okay. And has Duke Energy's discharges of bromide**

1 **contributed to the formation of trihalomethanes in**
2 **downstream drinking water intakes?**

3 MS. ROMANZO: Objection to form.

4 A. Along with other factors, we have seen -- we have
5 seen an increase in the brominated species of THMs
6 in municipal drinking waters. There's -- with
7 increased concentrations of bromides from our
8 discharges.

9 **Q. Okay. And does trihalomethane cause any health**
10 **problems?**

11 MS. ROMANZO: Objection to form.

12 A. I'm not a toxicologist. I can tell you it's a
13 regulated constituent.

14 **Q. Okay. Is it a carcinogen?**

15 MS. ROMANZO: Objection to form.

16 A. I think so. Again, I'm not a hundred percent sure.
17 I know there's a regulatory limit on it.

18 **Q. Okay. And going back through the particular**
19 **drinking water intakes, have bromide discharges from**
20 **ash basins contributed to trihalomethane formation**
21 **at the town of Madison?**

22 MS. ROMANZO: Objection to form.

23 A. So I'm going to answer that by saying, yes, Madison,
24 in the past, has had exceedances. The sole cause is
25 certainly not bromides from the Belews Creek Steam

1 Station.

2 Q. Okay. Has bromide from the Belews Creek Steam
3 Station contributed in any way to any exceedances?

4 A. Yes.

5 Q. Okay. And you said in the past. Approximately,
6 what time frame?

7 A. The last exceedance for the town of Madison that I
8 know of was in 2012. If they have had some since
9 then, Myra, I'm not -- I'm not aware. So we -- we
10 worked cooperatively with the Town of Madison to
11 install aerators in their elevated storage tanks,
12 sparge system, to drive off trihalomethanes.
13 Remember, I told you water age is a big component of
14 this particular reaction. So since we have worked
15 with them and done that, their trihalomethane
16 concentrations in their system have come down
17 dramatically.

18 Q. And I believe you also mentioned the city of Eden;
19 is that right?

20 A. That's correct.

21 Q. Has bromide discharges from Duke Energy's ash basin
22 at Belews contributed to trihalomethane exceedances
23 at Eden?

24 MS. ROMANZO: Objection to form.

25 A. Yes.

1 Q. Okay. And how many drinking water tanks, if I'm
2 using the right word, are affected at Eden?

3 A. That was in Madison that we installed the sparge
4 system.

5 Q. Okay.

6 A. Not Eden.

7 Q. Yes.

8 A. And there were two, that I know of.

9 Q. Two --

10 A. Two elevated tanks.

11 Q. -- at Madison?

12 A. Uh-huh (affirmative response), at Madison.

13 Q. Okay. And I guess I was just asking at Eden more
14 generally, are there different water tanks at Eden
15 or is it a single?

16 A. I don't know the exact setup of Eden's distribution
17 system.

18 Q. Okay. And do you know approximately what time frame
19 exceedances have occurred at the Eden site?

20 A. It was approximately the same as Madison, say, 2010-
21 to-2012 time frame.

22 Q. And how many people does the --

23 A. I don't know.

24 Q. Sorry. Let me get the question out first.

25 A. Yeah.

1 Q. How many people does the city of Eden serve?

2 A. I don't know.

3 Q. And do you know for the town of Madison?

4 A. I don't know.

5 Q. And I believe that you said there were also some
6 elevated levels at the Danville intake; is that
7 right?

8 A. Yes.

9 Q. Okay. And does Duke Energy's coal ash or discharges
10 of bromide from Duke Energy's coal ash at Belews
11 contribute to levels of trihalomethane in Danville?

12 MS. ROMANZO: Objection to form.

13 A. So I'm going to answer that and say potentially.

14 Q. Okay.

15 A. And I'm going to explain why. It's quite a bit
16 further downstream and there are other anthropogenic
17 sources of bromide between our discharge and their
18 drinking water intake.

19 Q. Okay. Have there been any exceedances of
20 trihalomethane standards at the Danville intake?

21 A. Just speculating, I think there have been. I don't
22 know the exact dates of them but, again, it's
23 available in the public record. But I think there
24 probably have been.

25 Q. Okay. Just a general question about all of these.

1 Has Duke Energy kept any records of bromide and
2 trihalomethane levels -- sorry -- taking one at a
3 time -- of trihalomethane levels at various water
4 supply intakes downstream?

5 A. No.

6 MS. ROMANZO: Objection to form.

7 Q. Okay. But Duke Energy has kept records of bromide
8 levels of the intake locations that you have
9 discussed earlier?

10 A. As I outlined earlier, yes.

11 Q. Okay. And you said that there had not been
12 exceedances that you were aware of of
13 trihalomethanes at Mayodan; is that right? Do you
14 know what levels of trihalomethanes have been
15 detected there?

16 A. Not specifically, but I don't think it's -- 80 is
17 the limit.

18 Q. Okay.

19 A. Eighty parts per billion. But one thing about
20 Mayodan, in particular, their intake is on the Mayo
21 River, which is a tributary to the Dan. Now, they
22 do -- and I don't know the details of the
23 arrangement -- but they do share or buy water from
24 Madison in some sort of purchase agreement. But I'm
25 not aware of the details of that. But they have a

1 permitted intake on the Mayo River.

2 Q. Okay. So they buy some water from Madison --

3 A. From Madison, that's correct.

4 Q. -- and have their own intake as well?

5 A. Yeah, that's my understanding.

6 Q. Okay. Do you know how many people the Danville

7 intake serves?

8 A. I do not.

9 Q. Okay. And shifting gears back to other parts of the

10 state, at the Rock Hill drinking water intake have

11 there been exceedances of trihalomethanes?

12 A. Yes.

13 Q. Do you know approximately what time frame?

14 A. Twenty/twelve, 2011.

15 Q. Okay.

16 A. And let me explain what I mean by exceedances.

17 Q. Yes.

18 A. So let's define that. The way a water system

19 measures trihalomethanes is at certain points within

20 their distribution system they keep a running

21 average, annual average, of those points. And

22 that's what triggers an exceedance. So if a certain

23 point averages about 80 parts per billion for the

24 year, then that would be an exceedance. One

25 sampling point in one quarter does not constitute an

- 1 exceedance, necessarily.
- 2 **Q.** Okay. And so, you know, given that definition of
- 3 exceedance, that's what you're using when you're
- 4 referring to exceedances --
- 5 **A.** Yes.
- 6 **Q.** -- in these responses?
- 7 **A.** Yeah.
- 8 **Q.** Okay. Have there been an exceedances since 2012 at
- 9 Rock Hill?
- 10 **A.** Not that I'm aware.
- 11 **Q.** Okay. And does Camden, the other drinking water
- 12 intake --
- 13 **A.** Yes.
- 14 **Q.** Okay. And have there been an exceedances of
- 15 trihalomethanes there?
- 16 **A.** Not that I'm aware of.
- 17 **Q.** Okay. Sorry. You may have said this earlier, but
- 18 approximately how far downstream is Rock Hill from
- 19 the Allen site?
- 20 **A.** So the Rock Hill, they have two intakes. And both
- 21 are located fairly close to the Wylie dam.
- 22 **Q.** Okay.
- 23 **A.** So from the Allen site itself down to the Wylie dam,
- 24 it's a few miles.
- 25 **Q.** Okay.

- 1 A. So roughly.
- 2 Q. And I might mispronounce this, was it the Lugoff?
- 3 A. Lugoff-Elgin.
- 4 Q. Okay. At the Lugoff-Elgin water intake, have there
5 been any exceedances of trihalomethane?
- 6 A. Not that I'm aware.
- 7 Q. Okay. I guess at -- going back to Camden, have
8 there been any increases in trihalomethanes that
9 you're aware of at that site?
- 10 A. Not that I'm aware.
- 11 Q. And how about at Lugoff-Elgin?
- 12 A. Not that I'm aware. But, again, we don't
13 necessarily track trihalomethane levels at these
14 municipalities unless we're approached by them, you
15 know, with a question or issues, so.
- 16 Q. Okay. And at the, I believe, downstream of the
17 Cliffside site, you said that Shelby was the first
18 one?
- 19 A. Uh-huh (affirmative response).
- 20 Q. The first drinking water intake?
- 21 A. Uh-huh (affirmative response).
- 22 Q. Have there been any exceedances of trihalomethanes
23 there?
- 24 A. Yes.
- 25 Q. Okay. And approximately what time frame?

1 A. That same time frame; 2011, 2012.

2 Q. Okay. And approximately how far is Shelby from the
3 Cliffside site?

4 A. Roughly 20 miles.

5 Q. And are you aware of any exceedances since 2012 at
6 Shelby?

7 A. No.

8 Q. Okay. And how about the Gaffney water intake, have
9 there been any trihalomethane exceedances?

10 A. Not that I'm aware.

11 Q. Okay. And the Columbia drinking water intake, any
12 trihalomethane exceedances?

13 A. Not that I'm aware.

14 Q. Okay. And downstream of the Marshall site,
15 Mooresville, have there been any trihalomethane
16 exceedances there?

17 A. Not that I'm aware.

18 Q. And how about at the Charlotte intake one?

19 A. No, no exceedances.

20 Q. Have there been any increases in trihalomethanes
21 there?

22 MS. ROMANZO: Objection to form.

23 A. At one particular point within their distribution
24 system.

25 Q. Do you know where that point is?

1 A. I don't know exactly. I know, roughly, it's in the
2 Matthews area.

3 Q. Okay.

4 A. And I know that it was a water age issue. It's
5 water that was at the end of the point.

6 Q. I see. And do you know approximately what time
7 frame that was?

8 A. Twenty/fourteen.

9 Q. Okay. And --

10 A. Maybe 2015 -- 2014, 2015, third quarter.

11 Q. Okay.

12 A. It was one of those years. It was the year that we
13 had a pretty -- pretty good drought and there was
14 some extended long periods of hot weather.

15 Q. I see. Okay. And I think you said earlier hot
16 weather -- temperature and hot weather can
17 increase --

18 A. Big factor.

19 Q. Okay. And how did you become aware of the
20 increasing trihalomethanes at the Charlotte 1
21 intake?

22 A. Publicly available data, publicly available website.

23 Q. Okay. So that was something that Duke Energy
24 investigated?

25 MS. ROMANZO: Objection to form.

1 A. That's correct.

2 Q. Okay.

3 A. And we initially became aware -- we had -- there's a
4 Catawba water users group, of which Duke Energy is a
5 part of, where we meet with various entities that
6 use water along the Catawba and they expressed some
7 concern.

8 Q. Okay. What time frame was that, approximately?

9 A. That would have been that 2014-2015 time frame.

10 Q. Okay. And what were the concerns that were
11 expressed in that meeting?

12 A. The specific concerns were elevated bromide
13 concentrations in their intake waters.

14 Q. Okay. And have discharges from Duke Energy's ash
15 basin at Marshall contributed to the increases in
16 trihalomethanes at the Charlotte intake?

17 A. They have.

18 Q. Okay.

19 A. So we were refining coal at Marshall and at Allen.
20 And what that means is there is a -- you can add
21 coal -- add brominated -- calcium bromide solution
22 prior to combustion. And bromide being very
23 reactive during the combustion process, it helps to
24 sequester mercury. So we were doing it to meet MATS
25 compliance obligations. During that time frame that

1 we were refining coal, bromide concentrations
2 increased substantially. And when I say
3 "substantially," I mean about an 80 percent
4 increase --

5 **Q. Okay.**

6 A. -- in our ash basin. And consequently there was an
7 increase in Catawba River bromide concentrations
8 that was manifesting itself through increased
9 trihalomethane formation at the Catawba drinking
10 water plants. So we ceased refining coal once the
11 plea agreement was signed May of 2015, and
12 subsequent bromide concentrations have --
13 subsequently, bromide concentrations have reduced
14 about 80 percent in our ash basin and roughly 75
15 percent in the Catawba River itself.

16 **Q. Okay. And in the Charlotte Intake 2, have there**
17 **been any exceedances of trihalomethanes, or is that**
18 **all part of -- sorry -- go ahead. I may be**
19 **misunderstanding how their intakes are laid out.**

20 A. Again, the trihalomethane wouldn't be at their
21 intake. It's in their system.

22 **Q. I see.**

23 A. So bromides -- that there was an increase in bromide
24 concentrations within the river.

25 **Q. Okay. And were there any exceedances of**

1 **trihalomethanes within the system?**

2 A. The same point, the Matthews location. So --

3 **Q. Okay.**

4 A. -- it all goes to the same drinking water plant.

5 **Q. Okay.**

6 A. Regardless of intake.

7 **Q. Okay. And then at the Gastonia water intake, in**

8 **that system, have there been any increases in**

9 **trihalomethanes?**

10 A. Not that I'm aware of.

11 **Q. Okay. And have there been any exceedances within**

12 **the Belmont system of trihalomethanes?**

13 A. Not that I'm aware of.

14 **Q. How about in Mount Holly?**

15 A. Not that I'm aware of.

16 **Q. Okay. And are the Mayo and Roxboro sites upstream**

17 **of the Danville drinking water intake?**

18 A. I'm trying to picture the map where they directly

19 flow in. I'd have to reference a map, so I would be

20 speculating. But I think the answer is yes, they're

21 upstream of the Danville water intake.

22 **Q. Okay.**

23 A. But I would need -- I would need to look at a map,

24 Myra, to answer definitively.

25 **Q. Okay. I apologize I don't have a map at the moment.**

1 But if just assuming for a moment that you're
2 correct, that they are upstream of the Danville
3 drinking water intake, would bromide discharges from
4 Mayo and Roxboro also be contributing to the
5 trihalomethane formation in that water intake?

6 MS. ROMANZO: Objection to form.

7 A. Potentially.

8 Q. Is there any reason you know of that they would not
9 be contributing to any trihalomethane increases?

10 A. Again, trihalomethane is not just a function of
11 halogen content. It's the way a system is operated.
12 Every municipality operates their system either more
13 efficiently, less efficiently, some better, some
14 worse. So depending on how the system is operated,
15 the way the system is engineered, sometimes halogen
16 aren't as large a factor in their trihalomethane
17 formation as it is at others. Specific types of
18 disinfection systems aren't as susceptible to
19 halogens. So, you know, when you ask did we
20 contribute to, I don't have the knowledge of the
21 particular drinking water system and the way it's
22 engineered to be able to answer that question so
23 that's why I say potentially.

24 Q. Okay. So for the Mayo and Roxboro site, there's the
25 potential that they have contributed?

1 A. Potentially.

2 Q. Okay. When did Duke Energy first become aware that
3 their -- this trihalomethane contamination in
4 downstream drinking water intakes?

5 MS. ROMANZO: Objection to form.

6 A. So it would have been late 2011, early 2012 time
7 frame because the agreement that we have with the
8 City of Madison to install the sparge systems that I
9 mentioned earlier, was signed January of 2012. So
10 sometime prior to that is when we became aware of
11 the issue.

12 Q. Okay. And how did Duke Energy first become aware of
13 the trihalomethane issue?

14 A. I am -- I am not aware of how we first became aware.
15 You know, in preparation for this, I thought this
16 question may come up. Unfortunately, the people
17 that were working on this particular agreement are
18 no longer with the company so I was not able to fact
19 check that.

20 Q. Okay. Who were those individuals?

21 A. Specifically Allen Stowe.

22 Q. Anyone else?

23 A. No.

24 Q. Okay. But is it -- was it the Madison contamination
25 that Duke Energy first became aware of of all the

1 drinking water intakes that we have discussed?

2 A. That's my understanding, yes; Madison and Eden.

3 Q. Okay. And when did Duke Energy first become aware
4 that there were bromide discharges coming from its
5 ash basins?

6 MS. ROMANZO: Objection to form.

7 A. That same time frame.

8 Q. Okay. Was it before or after Duke became aware of
9 trihalomethane concerns?

10 A. It was -- it was along with, kind of at the same
11 time.

12 Q. Okay. And so before Duke Energy became aware of the
13 trihalomethane concerns, it was not aware that there
14 was bromide coming out of the ash basin?

15 A. That's correct. But keep in mind, it's not a
16 regulated -- it's not something that's on a permit.
17 There's not a surface water quality standard, so
18 it's not something that we -- was on our radar.

19 Q. And was Duke Energy aware that there was bromide in
20 the ash basin area before that time?

21 A. No, no.

22 Q. Okay. And when did Duke Energy first disclose its
23 bromide discharges to the North Carolina Department
24 of Environmental Quality?

25 A. When it became apparent that bromide was going to be

1 on the -- or was on the Belews Creek NPDES permit.
2 So a subsequent permit was issued in October of
3 2012. And subsequently we had to put bromide
4 concentrations from the discharge on our DMRs.

5 **Q. Okay. So it was not disclosed prior to the time**
6 **that the trihalomethane concerns came to light?**

7 MS. ROMANZO: Objection to form.

8 A. It was not disclosed prior to -- that I know of --
9 it was not disclosed prior to it being on our Belews
10 Creek discharge permit. So there was no
11 communication with DEQ, that I'm aware of, you know,
12 prior to that.

13 **Q. Okay. And do you know approximately when bromides**
14 **would have been present in discharges starting with**
15 **the Belews Creek site?**

16 MS. ROMANZO: Objection to form.

17 A. So, again, bromides are -- they're present within
18 coal. So if there's no -- during the combustion
19 process, if there's no FGD scrubber, they go out the
20 flue gas. So not necessarily into the water stream.
21 So once an FGD scrubber is installed, it captures
22 them and it goes into the waste stream for the FGD
23 scrubber itself. So at Belews Creek, time frame for
24 the scrubber installation was '08, maybe.

25 **Q. And so for all of the sites it would have been --**

1 A. During the scrubber installation process.

2 Q. Okay. Have there been any attempts to treat the
3 trihalomethane in the downstream drinking water
4 intakes starting with the Belews site? I think you
5 touched on some of these earlier.

6 MS. ROMANZO: Objection to form.

7 A. I'm -- when you say "treat the trihalomethanes,"
8 that would be done at the municipal water treatment
9 plant.

10 Q. Okay. And so what have those treatments entailed at
11 the -- I think you talked about the Madison site
12 earlier. Have there been any additional treatments,
13 other than the aeration systems that have been
14 installed at the two tanks that you referred to?

15 MS. ROMANZO: Objection to form.

16 A. Not at Madison.

17 Q. Okay.

18 A. But we entered into an agreement with Eden.

19 Q. Okay.

20 A. And they are installing a -- or are in the process
21 of installing a chloramine system, disinfectant
22 system. And that particular system isn't as
23 susceptible to bromides in the source water.

24 Q. And what do you mean by it's not as susceptible to
25 bromides?

1 A. Increased bromide concentrations in the source water
2 for a chloramine system won't lead to elevated
3 trihalomethane formations in their distribution
4 system.

5 Q. Okay. So the bromides, even if it's still there,
6 will not lead to as much trihalomethane?

7 A. That's correct.

8 Q. Is it any trihalomethane or just not as much?

9 A. Not as much of that group of compounds;
10 trihalomethanes.

11 Q. Okay. And I guess taking them one at a time,
12 starting with the Madison aeration systems, have
13 those been successful at eliminating trihalomethanes
14 caused by bromide at the Madison intake?

15 A. No, not eliminating.

16 Q. Okay.

17 A. They have been successful at reducing -- about a 60
18 percent reduction in trihalomethanes within their
19 distribution system.

20 Q. And back to the Eden --

21 A. Chloramine.

22 Q. -- chloramine system, has that been successful at
23 reducing trihalomethanes?

24 A. So it's not operable yet.

25 Q. Okay.

1 A. The way the agreements between the parties read is
2 Duke was providing the funding, and the
3 municipalities contracted with engineering firms to
4 construct -- to engineer and construct their
5 systems. So the last that I understand is that
6 they're not -- the chloramine system is not
7 operable. It's constructed, it's in place, but I
8 don't think the switch has been flipped yet,
9 basically.

10 Q. Okay. So the extent to which that will reduce
11 trihalomethane remains to be seen?

12 A. That's correct.

13 Q. Do you know approximately when that system, the
14 chloramine system, will be put in place?

15 A. It's in place. When it will be operable, it will
16 just be speculation on my part. Again, that's Eden
17 working with their engineering contractor.

18 Q. Do you know approximately how long they have been
19 working on getting that --

20 A. That agreement was signed in June of 2012; that
21 agreement between us and the Town of Eden.

22 Q. Okay. And for the Danville system, do you know if
23 any treatments have been installed there?

24 A. Not that I'm aware.

25 Q. And has Duke Energy provided any funding for

1 **treatment at Danville?**

2 A. No.

3 **Q. Okay.**

4 A. There may be some. I mean, we had a settlement with
5 the City of Danville based on the Dan River spill.

6 **Q. Okay.**

7 A. So if some of those monies went to a treatment
8 system, I was not aware of that. But specifically
9 like we have with Eden and Madison, to answer the
10 question, is no.

11 **Q. Okay. And at the Rock Hill site, downstream of**
12 **Allen, have there been any treatments started there?**

13 A. Yes.

14 **Q. Can you describe those?**

15 A. I don't know the details. I know they have -- this
16 isn't anything that Duke Energy funded. But I know
17 through conversations through that Catawba water
18 users group that they have done some studies and had
19 some capital expenditures to treat bromides in
20 source water and trihalomethanes within their
21 system.

22 **Q. Okay. And do you know what type of treatment**
23 **they're using? Is it the aeration or the**
24 **chloramines?**

25 A. I don't.

1 Q. Okay. Are there any other treatments that you know
2 of besides the ones that we have discussed already
3 for treating the bromide-caused trihalomethanes in
4 the drinking water intakes?

5 MS. ROMANZO: Objection to form.

6 A. So I know that several municipalities, including the
7 city of Charlotte, have actively flushed water to
8 reduce water age within their system.

9 Q. Okay.

10 A. The others were along the Catawba. I want to say it
11 was Mount Holly and Gastonia as well have had to
12 flush water.

13 Q. Any other treatments that you know of?

14 A. No.

15 Q. And at the Shelby water intake location, have any
16 treatments been put there?

17 A. Not that I'm aware.

18 Q. Are you aware of any discussions about treatments at
19 the Shelby site?

20 A. No.

21 Q. And has Duke Energy provided any funding to the
22 Shelby --

23 A. No.

24 Q. And you said that at the Charlotte intake they were
25 flushing or they had started flushing the water. Is

1 that something that Duke Energy has provided any
2 funding for?

3 A. No.

4 MS. BLAKE: This might be a good moment to
5 take a quick break.

6 (WHEREUPON, a brief recess was observed.)

7 Q. I'm going to hand you an exhibit to be marked, I
8 guess, Hall Exhibit 1. Let me know once you have
9 had a chance to take a look at it.

10 (WHEREUPON, Hall Exhibit Number 1 was
11 presented for identification.)

12 A. Okay.

13 Q. Do you recognize this document?

14 A. I have not seen this document, no.

15 Q. Does it appear to be a copy of the City of Eden's
16 water quality report for the year 2015?

17 A. It does.

18 Q. If you haven't seen this document, are you familiar
19 with the content of the document? Have you seen it
20 in another form, for example?

21 A. So I have seen some of the data on the section for
22 disinfection byproduct, certainly the TTHM data
23 that's listed here.

24 Q. Okay. And so turning to that data, which I believe
25 is on page 5.

1 A. Right.

2 Q. The TTHM is that total trihalomethanes?

3 A. That's correct.

4 Q. And does the data present a range of trihalomethanes
5 that were detected during the year 2015?

6 A. It does.

7 Q. Okay. Do you know how many times the drinking water
8 intake was sampled at Eden during this time?

9 MS. ROMANZO: Objection to form.

10 A. The intake itself? Near the intake and the Dan
11 River, or do you mean within their system here?

12 Q. I'm sorry to be confusing. Let me clarify. I'm
13 asking about how many times Eden sampled within
14 their water system.

15 A. Yes. So, it's my understanding, that in order to
16 calculate these numbers, these averages, they take
17 quarterly samples at these four locations.

18 Q. And are those -- do you know where the four
19 locations are?

20 A. I do not.

21 Q. Okay.

22 A. They're labeled -- you know, they're just kind of
23 anonymously labeled, B-01 through B-04.

24 Q. But somewhere within the drinking water system,
25 right?

1 A. That's correct.

2 Q. Okay. And for the MCL for total trihalomethanes is
3 listed as ED on this document; is that right?

4 A. Yes.

5 Q. And are there some detections at some point in 2015
6 that were above ED in the city of Eden?

7 MS. ROMANZO: Objection to form.

8 A. There are. B-01 has a high of 86; B-02, has a high
9 of 89; and B-04 has a high of 87.

10 Q. Okay. And does the -- if you looked at -- towards
11 the bottom of that page, do you see a note just at
12 the bottom of the chart that says, "For TTHM, some
13 people who drink water containing trihalomethanes in
14 excess of the MCL over many years may experience
15 problems with their liver, kidneys or central
16 nervous systems, and may have an increased risk of
17 getting cancer." Do you see that statement?

18 A. I don't. I'm sorry.

19 Q. Oh, it's in kind of italics.

20 A. There we go. I see it, yes.

21 Q. Does Duke Energy have any reason to disagree with
22 that statement?

23 MS. ROMANZO: Objection to form.

24 A. I don't know. Again, I'm not a toxicologist. But I
25 would like to point out that in that -- in that

1 range that you had me look at, there is a low in
2 there of 38, 34, and 33. So what that says to me is
3 that somebody near that particular location isn't
4 consistently consuming water that's high in
5 trihalomethanes.

6 **Q. Okay.**

7 A. And the average -- averages, which are actually --
8 are actually in the 57, 57, 47, 56 range. So right
9 around that 50 to 55 range.

10 **Q. And if you take a look at that next paragraph**
11 **underneath the sentence that we were just looking**
12 **at.**

13 A. Uh-huh (affirmative response).

14 **Q. It talks about the changes that are being worked on**
15 **at the city of Eden's water supply system. And it**
16 **talks about chloraminated water, and in the very**
17 **last sentence it says, "There are three groups that**
18 **need to take special precautions when using**
19 **chloraminated water; kidney dialysis patient, fish**
20 **pond and aquarium owners, and specialized businesses**
21 **using high-quality treated water." Does Duke Energy**
22 **have any reason to disagree with that statement?**

23 MS. ROMANZO: Objection to form.

24 A. No.

25 **Q. Are you familiar at all with any of these groups**

1 that need to take special precautions when using
2 chloraminated water?

3 MS. ROMANZO: Objection to form.

4 A. I am not.

5 Q. Okay. And the chloraminated water, just to be
6 clear, is the treatment or the -- the "fix," if we
7 can call it that, that Eden is pursuing for
8 trihalomethane?

9 A. That's correct.

10 Q. Okay. I'm going to hand you another document. You
11 can set that one aside for now.

12 A. Okay.

13 Q. So this is will be Exhibit Hall 2. Okay. Do you
14 recognize Exhibit 2?

15 (WHEREUPON, Hall Exhibit Number 2 was
16 presented for identification.)

17 A. I do.

18 Q. Can you identify the document for the record?

19 A. This is the October or the fall of 2016, submittal
20 to DEQ satisfying a permit requirement, A-14, of our
21 NPDES for the Belews Creek Steam Station.

22 Q. Okay. And it's a semiannual progress report on
23 bromide reduction evaluation?

24 A. That's correct.

25 Q. Okay. And how frequently are the semiannual reports

1 submitted? It is once a year or multiple times a
2 year?

3 A. It's semiannually; twice a year.

4 Q. Okay. And is this the most recent progress report?

5 A. It is.

6 Q. Okay. And if you take a look on the second page.

7 A. Uh-huh (affirmative response).

8 Q. The progress report itself, and there's a heading
9 for the city of Eden. And it says, "City of Eden is
10 continuing work on its chloramines conversation
11 project. The project has been delayed due to
12 chemical feed control issues." Do you know what the
13 chemical feed control issues are that are listed
14 there -- or mentioned there?

15 A. I don't. So that would have been a communication
16 from their engineering contractor that I mentioned
17 earlier. I think it's Hazen and Sawyer is who they
18 had contracted to do that. So that would have been
19 a comment from them, you know, that we included into
20 this.

21 Q. Do you know if the chemical feed control issues have
22 been resolved at this point?

23 A. I don't. My understanding that they have not.

24 Q. Okay. You can set that aside for now too. Are you
25 aware that there are -- because I think you had

1 mentioned earlier that the trihalomethanes are a
2 group of contaminants or constituents and there are
3 four different constituents within that group; is
4 that right?

5 A. That's correct.

6 Q. Okay. And are those -- and I hope I'm pronouncing
7 this right -- bromodichloromethane and bromoform.

8 A. Correct.

9 Q. And dibromochloromethane.

10 A. Chloromethane.

11 Q. Okay. And chloroform?

12 A. That's correct.

13 Q. So are there any others besides those four?

14 A. Those are the four that are regulated.

15 Q. Okay. And are the ones that have bromo in the name,
16 are those bromide-related trihalomethanes?

17 A. That's correct.

18 Q. Okay. And are there maximum contaminant levels set
19 federally for the individual subcomponents of
20 trihalomethane?

21 MS. ROMANZO: Objection to form.

22 A. No, it's a summation of the four.

23 Q. Okay. And are there maximum contaminant level goals
24 for any of the four?

25 MS. ROMANZO: Objection to form.

1 A. Not that I'm aware of.

2 Q. I can hand you a document to help refresh or -- I'll
3 put that before you. This is Hall Exhibit 3. And
4 I'll just represent to you that this is a page taken
5 from EPA's website that lists national primary
6 drinking water regulations and it has MCLs for a
7 number of contaminants. And feel free to look over
8 the whole thing, but I'm going to ask you about Note
9 9 on the second to last page.

10 (WHEREUPON, Hall Exhibit Number 3 was
11 presented for identification.)

12 A. I see it.

13 Q. Okay. And does Note 9 describe individual maximum
14 contamination level goals for several of the
15 trihalomethane constituents?

16 A. It does.

17 Q. And the MCL goal for bromodichloromethane is zero as
18 listed here; is that right?

19 A. That's correct.

20 Q. And for bromoform it's also zero?

21 A. For bromoform it's listed as zero.

22 Q. Okay. And for dibromochloromethane it's 0.06
23 milligrams per liter?

24 A. That's correct.

25 Q. And does that refresh your recollection about

1 **whether there are MCL goals for these types of**
2 **trihalomethanes?**

3 A. Well, it's something that I haven't seen before --

4 **Q. Okay.**

5 A. -- I'll say that. So without, you know, taking some
6 time to understand it, I'd have to go through it a
7 little bit because it's -- up to this point it's
8 been my understanding, again, this isn't an area
9 that we're particularly regulated in, but it's my
10 understanding from the municipalities that they're
11 regulated on a summation of the four in the ED.
12 Kind of like that was listed in the Eden document.

13 **Q. Okay.**

14 A. Rather than the individual compounds.

15 **Q. Okay. And other than what you have learned from the**
16 **municipalities, have you -- do you have any reason**
17 **to think that these are not the -- the --**

18 A. Yeah.

19 **Q. (inaudible) at this time?**

20 A. Yeah. Again, I don't know -- I'm not sure where
21 this document came from, but I would have to kind of
22 go through it in a little more detail in order to
23 understand it.

24 **Q. Okay.**

25 A. So.

1 Q. Okay. And thank you. You can set that document
2 aside for now. And I'm going to hand you a couple
3 more exhibits.

4 A. Sure.

5 Q. This will be Exhibit 5.

6 COURT REPORTER: No, this is 4.

7 Q. Excuse me; four. I'm getting ahead of myself.
8 Thank you. And just so you have them side by side
9 this will be Exhibit 5. So let me know once you
10 have had a chance to familiarize yourself with
11 Exhibits 4 and 5.

12 (WHEREUPON, Hall Exhibit Numbers 4 and 5 were
13 presented for identification.)

14 A. Okay.

15 Q. Okay. So have you seen -- or, I guess, starting
16 with Exhibit 4 --

17 A. I have not.

18 Q. Okay. And could you, based on what you're seeing
19 right now, could you identify it for the record,
20 Exhibit 4?

21 A. Sure. Exhibit 4 looks like an e-mail exchange
22 within the North Carolina Public Water Section from
23 Jessica Godreau with an attachment. It's kind of
24 summarizing disinfection byproducts generated for
25 the town of Eden generated presumably from

- 1 discharges from Belews Creek Power Plant.
- 2 Q. Okay. And is it dated December 13, 2011?
- 3 A. It is.
- 4 Q. And the attachment is labeled "Summary of Bromide
- 5 Issues in the WSRO." Is that right?
- 6 A. That's correct.
- 7 Q. Okay. And does Exhibit 5 appear to be that
- 8 attachment?
- 9 A. It is, yes.
- 10 Q. Okay. So taking a look at Exhibit 5, the summary of
- 11 the Bromide issues, could you take a look at page 3
- 12 of that document in particular?
- 13 A. Uh-huh (affirmative response).
- 14 Q. And does page 3 include -- there's some chart
- 15 showing trihalomethanes.
- 16 A. It does.
- 17 Q. And it's for the town of Madison and the city of
- 18 Eden; is that right?
- 19 A. That's correct.
- 20 Q. Okay. And did the -- are the levels broken down --
- 21 are the trihalomethane levels broken down into the
- 22 four different components that we were talking about
- 23 earlier?
- 24 A. They are.
- 25 Q. And just looking at the total amount, do they appear

1 to increase over time starting in the 2008 time
2 frame or 2009 time frame for Madison?

3 A. They do. They seemed to have increased starting in
4 about 2008.

5 Q. Okay.

6 A. Two-thousand/nine.

7 Q. And then looking at the city of Eden, does this --
8 there appears to be some kind of -- I'm not entirely
9 sure what the "x" axis of this chart means, but
10 would a fair guess be that this is showing temporal
11 concentrations of trihalomethanes as well?

12 MS. ROMANZO: Objection to form.

13 A. That could be one interpretation.

14 Q. Okay. And do the levels of the types of
15 trihalomethane that are composed and part of
16 bromide, do those appear to have increased in
17 particular?

18 MS. ROMANZO: Objection to form.

19 A. They do.

20 Q. Okay. And in particular, bromoform, appears for the
21 first time in the 2009 time frame; is that right?

22 A. That's correct.

23 Q. Okay. And dibromodichloromethane also appears for
24 the first time -- it increases significantly in that
25 2009 time frame; is that right?

1 MS. ROMANZO: Objection to form.

2 A. That's correct.

3 Q. And the same thing for bromodichloromethane
4 increases in the -- starting in 2009?

5 MS. ROMANZO: Objection to form.

6 A. That's correct.

7 Q. Okay. And so if you take a look at the next page,
8 there's some pie charts on that page. And the, I
9 think, the -- what it's showing here is that the
10 percentage of trihalomethanes that are brominated
11 has increased between 2006 and 2011; is that right?

12 MS. ROMANZO: Objection to form.

13 A. That's correct.

14 Q. Okay. And so in 2006, about a little over 80
15 percent of the trihalomethanes were chloroforms; is
16 that right?

17 A. That's correct.

18 Q. And then in 2011, it's down to about 2 percent are
19 chloroforms; is that right?

20 A. That's correct.

21 Q. Okay. So is it fair to say that these charts and
22 graphs kind of collectively show that, you know,
23 starting in the 2009 time frame, trihalomethanes
24 increased, and also the brominated trihalomethanes,
25 in particular, increased a lot; is that fair?

1 MS. ROMANZO: Objection to form.

2 A. I think that's a fair statement.

3 Q. Okay. Thank you. You can set that document aside
4 now. Approximately how much has Duke Energy spent
5 on funding for treatment of trihalomethanes in
6 downstream water supplies?

7 MS. ROMANZO: Objection to form.

8 A. So with the city of Madison, approximately seven to
9 \$750,000. With the city of Eden, slightly in excess
10 of \$2 million.

11 Q. Okay. Are there any other fundings that Duke Energy
12 has provided to any other downstream drinking water
13 intakes?

14 A. No.

15 Q. Okay. Is that the -- is Duke Energy continuing to
16 provide funding to Madison and Eden or have the
17 amounts provided been the total?

18 A. That's the total. That fulfilled our kind of
19 agreement; contractual requirement, so.

20 Q. Okay. And has Duke Energy made any attempts or
21 efforts to reduce bromide discharges at any of its
22 ash basins?

23 MS. ROMANZO: Objection to form.

24 A. Yes.

25 Q. Okay.

1 A. We have. So, for instance, at Belews Creek, you
2 know, we have seen kind of the same numbers that are
3 -- that are -- you just outlined here. So remember
4 I told you that the bromides are naturally present
5 in the coal, so one of the steps that we have taken
6 at the Belews Creek Steam Station is to
7 preferentially run low-halogen coal.

8 In addition to that, the units themselves have
9 -- they just haven't been running as much.
10 Consequently, through those two steps, bromide
11 concentrations within the Dan River are within --
12 excuse me -- within our outfall have gone in the
13 early 2013 time frame until now, have been reduced
14 by approximately 20, 22 percent. And, you know,
15 subsequently, we have seen reductions in the Dan
16 River itself.

17 I mentioned earlier over on the Catawba that
18 we were refining coal. So we ceased the refining
19 coal process in May of 2015, and that led to a
20 considerable reduction of bromide in our ash basins,
21 as well as the Catawba River itself.

22 We have also, at the Catawba Nuclear Station,
23 we were using a brominated disinfectant. Bromides
24 are a very good disinfectant, which is they're
25 fairly ubiquitous in the industry. So they've used

1 quite a bit at cooling towers as a disinfectant and
2 algaecide. We switched off of that bromide
3 disinfectant at the cooling towers at Catawba.

4 And then at the other plants, at Cliffside, we
5 have, again, run, preferentially run, lower-halogen
6 fuel to try and reduce bromide concentrations in the
7 Broad River there.

8 **Q. Okay. Thank you for that. Is there anything else**
9 **beyond that?**

10 A. Yeah. I can -- so in addition, we have started
11 looking -- again, we didn't have a lot of data in
12 these basins on bromide because it's something that
13 we haven't looked at. It's not something that was
14 really regulated. So we started trying to define
15 what contributions we were having to these systems,
16 which led to the sampling plans that we discussed
17 earlier.

18 In addition to those steps, we identified
19 other anthropogenic sources, other industry and
20 specifically municipal wastewater treatment plants,
21 that presumably have industries that discharge to
22 their POTW. They're not treating for bromide, so
23 they're adding to the system as well. So it's kind
24 of a -- it's a really complex, you know, scenario
25 that's been set up. But we have actively kind of

1 looked to identify some of that.

2 We -- as required by the plea agreement, we
3 have instituted the claims process and notified all
4 these municipalities that there could be a potential
5 issue, and outlined the process by which they could
6 seek reimbursement from Duke Energy for legitimate
7 issues that are related to this. And, you know,
8 those are kind of the steps that we have taken in
9 regards to this issue.

10 **Q. Okay. So in a -- I believe you said at Belews and**
11 **at Cliffside, one of the steps is running low-**
12 **halogen coal?**

13 A. Lower-halogen coal.

14 **Q. Lower-halogen coal.**

15 A. Yeah, preferentially. That's correct.

16 **Q. And where, if you know, in the US is lower-halogen**
17 **coal sourced?**

18 A. Yeah. It's -- that's a tough one because coal -- we
19 traditionally run mid-Appalachian coal and it can
20 vary by seam, right? So you avoid running Powder
21 River Basin coal, which is higher in halogens, and
22 you preferentially run some of the lower-halogen
23 seam coal from the central Appalachian belt.

24 **Q. Okay.**

25 A. So.

1 Q. And you said that also at the Belews site, the units
2 had not been running as much.

3 A. That's correct.

4 Q. And by that, you mean the coal -- the generation
5 units?

6 A. The generation units.

7 Q. Okay.

8 A. Yeah. As gas becomes less expensive, the coal units
9 just aren't running as much.

10 Q. And is that true at Cliffside as well?

11 A. It is.

12 Q. Okay. And you said you -- Duke Energy has been
13 looking at other sources of bromides. Is there a
14 list or a document that Duke Energy has developed of
15 those other potential sources?

16 MS. ROMANZO: Objection to form.

17 A. We haven't developed a specific document, but we do
18 have data that point to certain municipal wastewater
19 treatment plants in certain industries. In addition
20 to just -- I mean, bromides are naturally occurring,
21 so, for instance, in saltwater, they're, you know,
22 three times the concentrations that we're talking
23 about here. So there is naturally occurring bromide
24 out there. So trying to define exactly what that is
25 as well, so. But, you know, we have -- the

1 municipal wastewater treatment plants, presumably
2 manufacturers, industries within those
3 municipalities that discharge to the POTW, water
4 goes to the municipal wastewater treatment plant,
5 not treated for bromides, and then discharged.
6 That's the -- you know, that's kind of what we have
7 been finding.

8 **Q. Okay. And has Duke Energy developed a background**
9 **level or range of bromide at any of the sites?**

10 MS. ROMANZO: Objection.

11 **Q. Or calculated a background level?**

12 MS. ROMANZO: Objection to form.

13 A. We have, yes. We have -- when you say "background,"
14 you mean naturally occurring, or do you mean kind of
15 at present state with things running?

16 **Q. Yes, yes.**

17 A. Okay.

18 **Q. Let's start at present state absent the influence of**
19 **the basins.**

20 A. Yes. So --

21 **Q. Okay.**

22 A. -- upstream of our operations on the Catawba, except
23 where there are spikes near potential other
24 anthropogenic sources, the background concentrations
25 seem to be in the 20 or 30 parts per billion range.

1 **Q. Okay.**

2 A. Downstream of our operations they are in the 50 to
3 60 parts per billion range.

4 **Q. Okay.**

5 A. On the Dan, upstream, again, it's in the 20 to 25
6 parts per billions range. Downstream of Belews
7 Creek it's in the 90 to 100 to 110 part per billion
8 range.

9 **Q. Okay.**

10 A. The difference there is a function of more water for
11 dilution in the Catawba than in the Dan. Levels
12 remain very low on the French Broad; in the 20 to 30
13 parts per billion range, either in front of and
14 after our outfall. And on the Broad River itself,
15 again, naturally occurring or upstream is 20 to 30.
16 Downstream is in that -- it's a little bit higher
17 than the Catawba, but not much, maybe 60 parts per
18 billion range.

19 **Q. Okay. And how about upstream versus downstream of**
20 **the Mayo and Roxboro sites?**

21 A. I don't have that data.

22 **Q. Okay. And has Duke Energy conducted any studies of**
23 **other possible treatments of bromides at the source?**

24 A. Yes. So, as a matter of fact, it was outlined in
25 the semiannual submittal to DEQ.

1 **Q. Okay.**

2 **A. We have partnered with the engineering folks out at**
3 UNC-Charlotte to work on a solution to sequester
4 halides, halogens, from our waste stream. We are at
5 the point now that we are ready for field trials
6 with that project and we're going to institute that
7 this year at Belews Creek. Removing the halides
8 from the water stream is fairly straightforward.
9 Sequestering the halides in such a way that they
10 don't come back out because the solubility factor is
11 more difficult. So that's what UNC-Charlotte and
12 their engineering team is helping us with.

13 **Q. Okay. And how does that relate to -- is that**
14 **different from transitioning to zero liquid**
15 **discharge at the sites?**

16 **A. It's different.**

17 **Q. Okay. Can you explain that difference to me?**

18 **A. Sure. So with the zero liquid discharge, you're**
19 still -- you're not sluicing ash, right? So -- but
20 you're still going to have the -- what we call
21 "blowdown," the wastewater from the FGD scrubber.

22 **Q. Okay.**

23 **A. So the bromides, you know, are still going to be**
24 there. This process works to sequester or remove
25 the halides, the bromide, from the waste stream

1 itself. So two totally different things. I mean --

2 **Q.** **Okay. Sorry. Were you going to say something more?**

3 **A.** **No.**

4 **Q.** **Okay. And would the -- is there a name for the**

5 **process of removing the halides from the waste**

6 **stream?**

7 **A.** **We just refer to it as halide sequestration --**

8 **Q.** **Okay.**

9 **A.** **-- study.**

10 **Q.** **Okay. And has Duke Energy engaged in any studies of**

11 **methods of removing the bromides from the ash basin?**

12 **The bromides that have already been discharged into**

13 **the ash basin?**

14 **A.** **No. From the basin itself?**

15 **Q.** **Yes.**

16 **A.** **No, no.**

17 **Q.** **Okay.**

18 **A.** **No.**

19 **Q.** **Sorry. I didn't mean to cut you off. You sounded**

20 **like you might want to say something else.**

21 **A.** **No.**

22 **Q.** **Okay. And for the halide sequestration studies and**

23 **implementation, do you know approximately how much**

24 **Duke Energy has spent on that to date?**

25 **A.** **I don't know.**

1 Q. And how about for the running of lower-halogen coal,
2 do you have a cost estimate of how much that costs?

3 MS. ROMANZO: Objection to form.

4 A. I don't know.

5 Q. Okay.

6 A. I'll say in general, lower-halogen coal is more
7 expensive than higher-halogen coal.

8 Q. Okay. Are you aware of any efforts by Stokes County
9 to install a new municipal water drinking intake on
10 the Dan River?

11 A. I am not.

12 Q. Okay. Are you aware of any new or proposed drinking
13 water intakes downstream of any of the plants that
14 we have talked about?

15 A. I am not.

16 Q. Okay. And I believe we have talked about how Duke
17 Energy became aware of the trihalomethane issues at
18 Eden and Madison and at Catawba. How did Duke
19 Energy become aware of the trihalomethane issues at
20 the Rock Hill intake?

21 MS. ROMANZO: Objection to form.

22 A. Through the meeting that I had mentioned earlier of
23 the Catawba water users group.

24 Q. Okay.

25 A. So we have attempted to be -- once we became --

1 there was some awareness around this issue, we have
2 attempted to be as open and transparent as possible
3 in dealing with these municipalities. We truly
4 consider them a partner on the Catawba. So we held
5 a meeting with the Catawba water users group and
6 shared data with them, so. And that's where at that
7 meeting, that's where we found out, you know, that
8 Rock Hill was having an issue through that group.

9 **Q. Okay. And was that the meeting in the -- what time**
10 **frame was that meeting in again?**

11 A. So there were a series of meetings.

12 **Q. Okay.**

13 A. Beginning in about the fall of 2015, I think there's
14 been three meetings.

15 **Q. Okay.**

16 A. I'd have to look up the exact dates. But,
17 essentially, from the fall of 2015 through maybe the
18 summer of 2015. But, anyway, that kind of time
19 frame through the middle of last year.

20 **Q. Okay.**

21 A. So.

22 **Q. Okay.**

23 A. And we found out at those meetings as well that with
24 the cessation of the refined coal process and some
25 of our other changes, the recent THM numbers in

1 these municipalities are showing are down quite a
2 bit. So their concern has been diminished.

3 MS. BLAKE: Okay. Can we go off the record
4 for a second.

5 (WHEREUPON, a brief recess was observed.)

6 **Q. So just a few follow-up questions. We talked**
7 **earlier about drinking water intake in Mayo Lake.**
8 **Do you know approximately where that intake is or**
9 **was located in relation to the coal ash at Mayo?**

10 **A. I'm sorry, I don't know.**

11 **Q. Okay. And are you aware that Duke Energy has**
12 **recently submitted a permit application requesting**
13 **use of halide salts to treat mercury and other toxic**
14 **air emissions at the Allen Steam Station?**

15 MS. ROMANZO: Objection to form. And to the
16 extent you're asking about permit terms,
17 that would have also been covered by
18 Shannon Langley yesterday. He can
19 answer, if he knows.

20 **A. No, I don't know about that.**

21 **Q. And this is an air permit, but it relates to the**
22 **halide issues that you were testifying about**
23 **earlier. And you're not aware of the draft permit**
24 **that DEQ recently issued that would allow the use of**
25 **halide salts at the Allen Steam Station?**

1 MS. ROMANZO: Objection to form.

2 A. I was not aware of that.

3 Q. Okay.

4 A. But I will say --

5 Q. Yes.

6 A. -- that we have set up a process at Duke before any
7 halogenated compound is used at one of our coal
8 facilities it comes through my group in
9 environmental for review. So, you know, any kind of
10 halogenated compound, we will be notified of prior
11 to use.

12 Q. Okay. And would that raise any concerns for you if
13 there was a proposal to increase use of halide salts
14 with regard to bromide issues?

15 MS. ROMANZO: Objection to form.

16 A. Yes.

17 Q. And what are those concerns, just to sum up?

18 MS. ROMANZO: Objection to form.

19 A. The concerns would be increased halogen
20 concentrations within the ash basin itself.

21 Q. And could that increase discharges downstream or --

22 MS. ROMANZO: Objection.

23 Q. Go ahead.

24 MS. ROMANZO: Objection to form.

25 A. Yes.

1 MS. BLAKE: Okay. That's all the questions
2 that I have for today.

3 WITNESS: Okay.

4 MR. BENZONI: I have just a few questions.

5 WITNESS: Okay, sure.

6 EXAMINATION BY MR. BENZONI:

7 **Q. The sampling in the Catawba River that you**
8 **mentioned, is that -- if I understood you correctly,**
9 **you said that is not part of the routine sampling?**

10 A. No. So there are points that are the routine
11 sampling within the Catawba, but there were
12 additional locations added in order to characterize
13 bromide concentrations in that basin.

14 **Q. And how often are those additional locations -- how**
15 **often are those sampled?**

16 A. So initially -- and when I say "initially," I mean
17 right after the signing of the plea agreement --
18 that would have been spring of 2015, it was monthly.
19 Again, we were trying to characterize bromide
20 concentrations. We just, like I said, there was a
21 paucity of data out there. We just didn't know.

22 So, subsequently, with the cessation of the
23 refined coal process and kind of a better
24 understanding of halogen levels within the basin, we
25 have switched that back to once every three months.

1 The concentrations, as I said earlier, have
2 stabilized in that 50 to 60 parts per billion range.
3 So there's just not the need to go out there on a --
4 as frequent basis.

5 **Q. And so but that sampling regimen is ongoing?**

6 **A. It is. It is, yes.**

7 **Q. And the concentrations in downstream from Belews**
8 **Creek, I believe you said it was 90 to 110?**

9 **A. Ninety to a hundred ten.**

10 **Q. And you may have mentioned this, but I think I**
11 **missed it. Why is that so much higher than the**
12 **concentrations in the Catawba, French Broad, and**
13 **Broad?**

14 **A. Yeah. It's a good -- it's higher in the Catawba**
15 **simply because of dilution. So there's just more**
16 **water in the Catawba, okay? So remember the**
17 **background waters are in that 20 range; so absent**
18 **any anthropogenic sources that we have seen.**

19 So in the Dan, there's just a lot less water,
20 so the percentage that our discharge makes up of
21 waters within the Dan is greater. Cliffside, the
22 Broad's a little bit bigger than the Dan from a flow
23 regime. And then, you know, it's just a function of
24 Belews Creek runs more, even though it hasn't been
25 running as much, it runs more than some of those

1 others, so.

2 **Q. In that 90 to a hundred and ten parts per billion**
3 **figure downstream of Belews Creek, did you testify**
4 **that you don't know if it includes Mayo or Roxboro**
5 **or that it does not include Mayo or Roxboro?**

6 **A.** It does -- the concentrations increase as you get
7 closer to Belews. The confluence of the tributary
8 of which Roxboro and Mayo operate with the Dan is
9 pretty far downstream. Now, you do see another
10 increase from -- at that point where that comes in.
11 But it's only about a 10 to 11 ppb increase at that
12 particular point. And it gets even more complicated
13 because of the multiple municipal wastewater
14 treatment plants that are located in that area too,
15 having a causal -- contributing factor as well.

16 **Q. Okay. And what is the total after the confluence?**
17 **What is --**

18 **A.** It's in the 95 range.

19 **Q. Okay.**

20 **A.** And I'm giving you averages. There are highs and
21 lows, right? But that's an average.

22 **Q. And in terms of the inclusion of bromide in the**
23 **NPDES permit for Belews Creek, was that triggered**
24 **specifically by the findings at Madison and Eden?**

25 **A.** So I don't know the genesis of that. That would

1 have been something -- I know when we submitted for
2 the draft permit in August of 2011, bromides were
3 not on there. And I know bromides were not on the
4 previous permit. And during that time frame, there
5 were conversations that took place of which there's
6 no record that -- I'm not aware -- that led to --
7 between Eden, Madison, Duke, and DEQ obviously, now
8 that I've seen today were involved in that in some
9 capacity, that led to an April notification from DEQ
10 that they were going to add bromides to -- as a
11 monitoring report -- to our Belews Creek permit.
12 That's the earliest kind of documentation that I've
13 seen; communication from the State that actually had
14 it on there. But we were aware of it prior to that,
15 because we signed the Madison agreement in January
16 of 2012. So, you know, but what that looked like,
17 you know, I can't say or how we exactly became aware
18 of it. But there were some conversations there.

19 **Q. And do you know if there's been any conversations to**
20 **include bromide in any other NPDES permits besides**
21 **Belews Creek?**

22 **A.** I don't; not that I'm aware.

23 **Q. In the halide sequestration study that you**
24 **mentioned, I believe that you testified that the**
25 **real challenge is that bromide is so soluble that**

1 **keeping it sequestered is a challenge; is that --**

2 A. That's exactly correct. So there's going to be a
3 waste stream. When you treat that water, there's
4 going to be some sort of waste stream generated,
5 some sort of reject water. What to do with that, if
6 you take it to -- you can't take it to the basin,
7 obviously. So you take it to a landfill, it's going
8 to come out in the leachate. So the work is to kind
9 of solidify it, to sequester it so that it can be
10 appropriately landfill. That's the driver behind
11 the work.

12 **Q. Okay. So it's to solidify it and then keep it in**
13 **that form not letting it get --**

14 A. Correct. Correct.

15 **Q. Okay.**

16 A. There are other options. You could take it and
17 generate bromine gas. But we have eliminated that
18 pretty quick because of the toxicity of bromine gas
19 and you don't want those trucks. That would -- that
20 would not be a good solution. So those were
21 eliminated fairly quickly.

22 **Q. You said that the field studies are -- or field**
23 **trials, rather, are being developed for that?**

24 A. This year. So they have demonstrated it on a bench-
25 scale level in the laboratory. The 2017 plan is to

1 field trial that. So that's being implemented kind
2 of as we speak, really, so.

3 **Q. And where is it going to be implemented?**

4 **A. Belews Creek.**

5 **Q. Belews Creek.**

6 **A. Uh-huh (affirmative response), yes.**

7 **Q. And will that be -- or is there any plans to expand**
8 **it to other facilities if it's successful?**

9 **A. Depending on the success. Yeah, depending on the**
10 **success, so.**

11 MR. BENZONI: Thank you, Mr. Hall. That's all
12 my questions.

13 WITNESS: Sure thing.

14 EXAMINATION BY MS. ROMANZO:

15 **Q. I just have a couple of questions for you just to**
16 **clarify some things that you said. Regarding**
17 **exceedances of trihalomethane you were talking about**
18 **earlier, do you recall talking about those?**

19 **A. I do.**

20 **Q. In the most recent sampling data that you have, are**
21 **you aware of exceedances of trihalomethanes near any**
22 **of the plants?**

23 **A. No. So with the cessation of the refined coal and**
24 **then some of the changes at Madison, and the kind of**
25 **greater awareness of halogen content of coal at**

1 Belews Creek, recent data have been pretty positive,
2 very positive. There have been no exceedances of
3 the ED that I've seen, that we have been made aware
4 of.

5 **Q. Okay. You also talked about a claims process for**
6 **the municipalities. Do you remember discussing**
7 **that?**

8 A. I do.

9 **Q. Is there a deadline for municipalities to make**
10 **claims under that process?**

11 A. Yeah. So the claims process is very specific and
12 detailed. But the municipalities have until
13 November of this year, 2017, to file their intent to
14 file a claim. And then they have through February
15 of 2018 to file the claim. So, you know, this
16 claims process was developed about a year ago. Sent
17 out in April of 2016 with, you know, the
18 municipalities became aware of it and became aware
19 of the process.

20 We have given them, you know, this long
21 because there's seasonal effects to the THM
22 formation. So they have been given a long time, a
23 year and a half or so, to come up with their data.
24 And the way the claims process worked -- works, they
25 submit that to the court-appointed monitor, who then

1 is kind of the arbiter of that whole process. We
2 can support, you know, our arguments as well. But
3 he is the ultimate decision-maker there. If either
4 party disagrees with the decision that the CAM
5 makes, then we can go to the federal judge for
6 appeal. But that's in general the way it works.
7 But in terms of time frames, they have until
8 November of this year to file their intent to file a
9 claim.

10 MS. ROMANZO: Okay. No further questions.

11 MS. BLAKE: No further questions from me as
12 well.

13 MR. BENZONI: No further questions.

14 (WHEREUPON, the deposition was concluded at
15 12:15 P.M.)

16 * * * * *

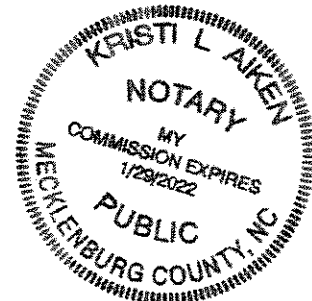
I have read the foregoing
pages 1 through 92,
inclusive, and find that
they contain a true and
accurate transcript of my
testimony given therein;
with the exception of
corrections on the attached
errata sheet, if any.


ZACHARY SCOTT HALL

Sworn and subscribed before me
this 21st day of March, 2017.


Kristi L. Aiken
Notary Public

My Commission Expires: 1/29/2022



E R R A T A S H E E T

RE: STATE OF NORTH CAROLINA ex rel, v DUKE ENERGY
PROGRESS, LLC.
CASE NOS.: 13-CVS-11032 and 13-CVS-14461
WITNESS: ZACHARY SCOTT HALL

Please read this transcript with care, and if you find any corrections or changes you wish made, list them by page and line number below. There is no need to return the condensed transcript.

To assist you in making any such corrections, please use the form below. If supplemental or additional pages are necessary, please furnish same and attach them to this errata sheet. Please return this information within thirty (30) days of receipt.

Page _____ Line _____ should
read: _____

Page _____ Line _____ should
read: _____

Page _____ Line _____ should
read: _____

Page _____ Line _____ should
read: _____

Page _____ Line _____ should
read: _____

C E R T I F I C A T E

STATE OF NORTH CAROLINA

COUNTY OF MECKLENBURG

I, Rebekah Gervin Creel, Nationally Certified
Verbatim Reporter and Notary Public in and for the County
of Mecklenburg, State of North Carolina, do hereby
certify;

That there appeared before me the foregoing
witness at the time and place herein aforementioned; that
the foregoing pages constitute a true and correct
transcription of the proceedings.

I do further certify that the persons were
present as stated in the appearances.

I do further certify that I am not of counsel
for or in the employment of any of the parties to this
action, nor do I have any interest, financial or
otherwise, in the result thereof.

IN WITNESS WHEREOF, I have hereunto set my
hand this 17th day of February, 2017.

Rebekah Gervin Creel, N.P.

Notary Public No.: 19942760095

<p>A</p> <p>A-14 63:20</p> <p>A.M 1:7 4:9</p> <p>able 6:8 34:5 50:22 51:18</p> <p>absent 77:18 86:17</p> <p>absolutely 31:10</p> <p>accurate 6:8 93:5</p> <p>action 95:16</p> <p>active 29:4</p> <p>actively 58:7 74:25</p> <p>add 47:20,21 88:10</p> <p>added 85:12</p> <p>adding 74:23</p> <p>addition 31:11 73:8 74:10,18 76:19</p> <p>additional 54:12 85:12,14 94:12</p> <p>aeration 54:13 55:12 57:23</p> <p>aerators 38:11</p> <p>affect 36:16</p> <p>affirmative 7:4,15 12:8 16:23 32:15 39:12 44:19,21 62:13 64:7 69:13 90:6</p> <p>aforementioned 95:9</p> <p>age 38:13 46:4 58:8</p> <p>ago 5:6 91:16</p> <p>AGREED 4:11</p> <p>agreement 8:14 20:14 21:21,25 27:12 29:20,20 41:24 48:11 51:7 51:17 54:18 56:20,21 72:19 75:2 85:17 88:15</p>	<p>agreements 56:1</p> <p>ahead 48:18 68:7 84:23</p> <p>air 83:14,21</p> <p>algaeicide 74:2</p> <p>Allen 13:6 17:19 18:23 19:1,2,7 26:16,25 43:19 43:23 47:19 51:21 57:12 83:14,25</p> <p>Allen's 17:20</p> <p>ALLIANCE 1:7 1:21,22</p> <p>allow 83:24</p> <p>American 2:12</p> <p>amount 69:25</p> <p>amounts 72:17</p> <p>analytical 11:12 11:19</p> <p>Anderson 3:11</p> <p>annual 3:14 24:4 42:21</p> <p>anonymously 60:23</p> <p>answer 12:15 29:15 34:5 37:23 40:13 49:20,24 50:22 57:9 83:19</p> <p>anthropogenic 15:18,23 16:6 40:16 74:19 77:24 86:18</p> <p>anybody's 15:21</p> <p>anyway 82:18</p> <p>apologize 27:19 49:25</p> <p>Appalachian 1:19 75:23</p> <p>apparent 52:25</p> <p>appeal 92:6</p> <p>appear 59:15 69:7 69:25 70:16</p> <p>appearances 95:13</p>	<p>appeared 95:8</p> <p>appears 33:20 70:8,20,23</p> <p>application 83:12</p> <p>approached 44:14</p> <p>appropriately 89:10</p> <p>approximately 16:16 18:5,13,21 19:20 20:10 21:19 22:7 29:7 32:19,22 38:5 39:18,20 42:13 43:18 44:25 45:2 46:6 47:8 53:13 56:13,18 72:4,8 73:14 80:23 83:8</p> <p>April 20:22 21:5,5 88:9 91:17</p> <p>aquarium 62:20</p> <p>aquatic 11:7</p> <p>arbiter 92:1</p> <p>area 20:5 46:2 52:20 67:8 87:14</p> <p>areas 8:19,21</p> <p>arguments 92:2</p> <p>arms 15:20</p> <p>arrangement 41:23</p> <p>ash 12:11,24 13:1 13:16 14:3,5,7 30:22,24 31:11 31:12,23,25 32:10,11 33:3,10 33:11 34:8,9,14 35:8 37:20 38:21 40:9,10 47:14 48:6,14 52:5,14 52:20 72:22 73:20 79:19 80:11,13 83:9 84:20</p> <p>Asheville 19:14</p> <p>aside 14:15 63:11 64:24 68:2 72:3</p>	<p>asking 22:25 31:2 31:5,7 33:8,24 39:13 60:13 83:16</p> <p>assist 94:11</p> <p>ASSOCIATION 1:8,20,21</p> <p>assuming 50:1</p> <p>attach 94:13</p> <p>attached 93:8</p> <p>attachment 68:23 69:4,8</p> <p>attempted 81:25 82:2</p> <p>attempts 54:2 72:20</p> <p>attorney 5:6,16</p> <p>August 88:2</p> <p>available 26:19,19 27:13,13 40:23 46:22,22</p> <p>average 42:21,21 62:7 87:21</p> <p>averages 42:23 60:16 62:7 87:20</p> <p>avoid 75:20</p> <p>aware 26:8,12,14 30:7,12,15 31:14 32:9 34:7,11,12 38:9 41:12,25 43:10,16 44:6,9 44:10,12 45:5,10 45:13,17 46:19 47:3 49:10,13,15 51:2,10,12,14,14 51:25 52:3,8,12 52:13,19 53:11 56:24 57:8 58:17 58:18 64:25 66:1 81:8,12,17,19 83:11,23 84:2 88:6,14,17,22 90:21 91:3,18,18</p> <p>awareness 82:1 90:25</p>	<p>axis 70:9</p> <p>B</p> <p>B 3:1</p> <p>B-01 60:23 61:8</p> <p>B-02 61:8</p> <p>B-04 60:23 61:9</p> <p>back 8:13 12:9 25:24,24 37:18 42:9 44:7 55:20 79:10 85:25</p> <p>background 77:8 77:11,13,24 86:17</p> <p>Bank 2:12</p> <p>based 57:5 68:18</p> <p>basically 56:9</p> <p>basin 1:8,20,21 8:23,23 13:1,16 14:3,5,7 18:17 30:22,25 31:11 31:24 32:10,12 33:3,11,12 34:8 34:10,14 35:8 38:21 47:15 48:6 48:14 52:14,20 75:21 80:11,13 80:14 84:20 85:13,24 89:6</p> <p>basins 8:24 12:11 12:24 31:12 37:20 52:5 72:22 73:20 74:12 77:19</p> <p>basis 24:4 86:4</p> <p>beginning 4:9 82:13</p> <p>behalf 6:13 12:9</p> <p>Belews 3:12 9:4 13:4 14:16,20,22 15:1,2,11,16 16:1,24 17:1,4 17:15 22:3 24:19 24:21 25:12 26:3 28:19,25 32:1,10</p>
--	--	--	---	---

37:25 38:2,22 40:10 53:1,9,15 53:23 54:4 63:21 69:1 73:1,6 75:10 76:1 78:6 79:7 86:7,24 87:3,7,23 88:11 88:21 90:4,5 91:1 believe 7:14 13:16 25:10 30:18 38:18 40:5 44:16 59:24 75:10 81:16 86:8 88:24 Belmont 28:11 49:12 belt 75:23 bench- 89:24 Benzoni 2:6,21 85:4,6 90:11 92:13 better 6:5 50:13 85:23 beyond 74:9 big 35:25 38:13 46:18 bigger 86:22 Bill 9:20,21,22 billion 41:19 42:23 77:25 78:3 78:7,13,18 86:2 87:2 billions 78:6 bind 6:13 bit 40:15 67:7 74:1 78:16 83:2 86:22 Blake 2:3,19 5:4,5 10:11 11:5 33:16 34:4 59:4 83:3 85:1 92:11 blowdown 14:1 79:21 Boston 25:23 26:11	bottom 61:11,12 Box 2:8 break 59:5 brief 59:6 83:5 Broad 8:24,24 19:10 20:7,9 22:6 74:7 78:12 78:14 86:12,13 Broad's 86:22 broken 69:20,21 bromide 3:13,21 8:8,17 12:23 13:18,20 14:25 15:15,18,21 22:20 23:9 24:5 24:18 26:5 27:11 30:2,15,22,24 31:10,16 33:18 34:15,19 35:13 35:16,24 36:4,4 36:23,25 37:19 38:2,21 40:10,17 41:1,7 47:12,21 47:22 48:1,7,12 48:13,23 50:3 52:4,14,19,23,25 53:3 55:1,14 63:23 69:4,11 70:16 72:21 73:10,20 74:2,6 74:12,22 76:23 77:9 79:25 84:14 85:13,19 87:22 88:20,25 bromide-caused 58:3 bromide-related 65:16 bromides 12:19 13:2,22 14:1,3 14:12,20 24:7 31:15,20 35:10 37:7,25 48:23 53:13,17 54:23 54:25 55:5 57:19	73:4,23 76:13,20 77:5 78:23 79:23 80:11,12 88:2,3 88:10 brominated 37:5 47:21 71:10,24 73:23 bromine 89:17,18 bromo 65:15 bromodichloro... 65:7 66:17 71:3 bromoform 65:7 66:20,21 70:20 businesses 62:20 buy 41:23 42:2 byproduct 35:22 59:22 byproducts 68:24 <hr/> C <hr/> C 2:1 95:1,1 calcium 47:21 calculate 60:16 calculated 77:11 call 63:7 79:20 called 8:17 16:5 26:1 CAM 92:4 Camden 26:21 43:11 44:7 cancer 61:17 capacity 34:3 88:9 CAPE 1:8 capital 57:19 captures 18:22 53:21 carbon 36:1,9,20 carcinogen 37:14 care 94:7 Carolina 1:1,3,3 1:13,15,16 2:4,7 2:9,13 4:4,8 25:25 52:23 68:22 94:2 95:2 95:6	Carolina-Tenne... 20:8 CAROLINAS 1:24 CASE 94:4 Catawba 1:19 8:22 17:21,21 18:19,24 19:6,7 20:3 22:8 28:15 47:4,6 48:7,9,15 57:17 58:10 73:17,21,22 74:3 77:22 78:11,17 81:18,23 82:4,5 85:7,11 86:12,14 86:16 causal 35:20 87:15 cause 35:17 37:9 37:24 caused 12:11,23 55:14 ceased 48:10 73:18 Center 2:3 5:7 central 61:15 75:23 certain 42:19,22 76:18,19 certainly 37:25 59:22 Certified 4:6 95:4 certify 95:7,12,14 cessation 82:24 85:22 90:23 chain 3:19 7:3,5 challenge 88:25 89:1 chance 59:9 68:10 changes 62:14 82:25 90:24 94:8 Chapel 2:4 characterize 18:17 23:9 85:12 85:19 characterizing	22:20 Charlotte 1:8 2:13 4:8 28:3,5,7 45:18 46:20 47:16 48:16 58:7 58:24 Charlotte's 18:15 28:2 chart 61:12 69:14 70:9 charts 71:8,21 check 51:19 chemical 64:12,13 64:21 chemistry 11:8,12 11:19 chloraminated 62:16,19 63:2,5 chloramine 54:21 55:2,21,22 56:6 56:14 chloramines 57:24 64:10 chlorine 36:5 chloroform 65:11 chloroforms 71:15 71:19 Chloromethane 65:10 city 3:8 18:2,15 28:10,10,11 38:18 40:1 51:8 57:5 58:7 59:15 61:6 62:15 64:9 64:9 69:17 70:7 72:8,9 Civil 4:5 claim 20:18,19 91:14,15 92:9 claims 20:1,12,24 21:1 26:4,18 27:12 29:11,18 75:3 91:5,10,11 91:16,24 clarification 15:4
---	---	---	---	---

clarify 11:1 35:4 60:12 90:16 CLEAN 1:21 clear 63:6 Cliffside 13:8 19:19,22 27:1 44:17 45:3 74:4 75:11 76:10 86:21 close 43:21 closer 17:5 87:7 CLUB 1:7 coal 10:1 12:11 13:21,22 40:9,10 47:19,21 48:1,10 53:18 73:5,7,18 73:19 75:12,13 75:14,17,18,19 75:21,23 76:4,8 81:1,6,7 82:24 83:9 84:7 85:23 90:23,25 collect 8:11 15:15 18:6 19:16 22:23 collected 8:7 15:10,13 21:10 21:12,15 22:10 23:1,6,7 24:25 collectively 71:22 Columbia 20:10 27:4,6 45:11 combusted 13:21 combustion 13:23 47:22,23 53:18 come 21:1 31:10 36:9 38:16 51:16 79:10 89:8 91:23 comes 14:2 25:24 32:10 34:9 84:8 87:10 coming 15:24,24 16:7 18:1 33:11 52:4,14 comment 64:19 Commission	93:18 communication 53:11 64:15 88:13 company 6:14 51:18 complete 6:8 complex 74:24 compliance 47:25 complicated 87:12 component 38:13 components 69:22 composed 70:15 compound 14:13 31:21 84:7,10 compounds 55:9 67:14 concentrations 8:8 15:17 18:17 22:20 23:9 34:20 37:7 38:16 47:13 48:1,7,12,13,24 53:4 55:1 70:11 73:11 74:6 76:22 77:24 84:20 85:13,20 86:1,7 86:12 87:6 concern 12:18 47:7 83:2 concerns 26:6 47:10,12 52:9,13 53:6 84:12,17,19 concluded 92:14 condensed 94:10 conducted 78:22 confluence 87:7 87:16 confusing 60:12 consent 4:3 consequently 48:6 73:10 conservation 5:8 consider 82:4 considerable 73:20	consistently 62:4 constituent 12:18 12:21 15:19 37:13 constituents 23:13 23:15 35:20 65:2 65:3 66:15 constitute 42:25 95:10 construct 56:4,4 constructed 56:7 consuming 62:4 contain 93:4 containing 61:13 contaminant 65:18,23 contaminants 65:2 66:7 contamination 7:17,19 11:23 12:12,16,18 30:15 31:6,8 51:3,24 66:14 content 50:11 59:19 90:25 CONTENTS 2:17 context 33:21 continuing 64:10 72:15 contracted 56:3 64:18 contractor 56:17 64:16 contractual 72:19 contrary 33:20 contribute 13:2 13:17 40:11 50:20 contributed 12:11 12:24 37:1,20 38:3,22 47:15 50:25 contributing 50:4 50:9 87:15 contributions	74:15 control 64:12,13 64:21 conversation 64:10 conversations 57:17 88:5,18,19 cooling 74:1,3 cooperatively 38:10 copy 59:15 corporate 11:12 correct 12:2 14:9 14:11 23:14 24:12,14 38:20 42:3 47:1 50:2 52:15 55:7 56:12 60:3 61:1 63:9 63:24 65:5,8,12 65:17 66:19,24 69:6,19 70:22 71:2,6,13,17,20 75:15 76:3 89:2 89:14,14 95:10 corrections 93:8 94:8,11 correctly 85:8 cost 81:2 costs 81:2 counsel 4:3,3,12 7:6 9:17 10:9 95:14 County 1:2,14 81:8 95:3,5 couple 9:15 68:2 90:15 course 11:5 COURT 1:1,1,13 1:14 68:6 court-appointed 20:20 91:25 courtroom 5:21 5:22 cover 8:19,21 21:6 covered 11:2 31:3	33:14,25 83:17 covers 8:22 19:5,6 Cowans 18:3,12 28:6 Creek 3:12 9:4 14:16,20,22 15:2 15:16 16:1,5,22 24:19 28:20,25 32:1,10 37:25 38:2 53:1,10,15 53:23 63:21 69:1 73:1,6 78:7 79:7 86:8,24 87:3,23 88:11,21 90:4,5 91:1 Creel 4:5 95:4,23 current 9:9,10 cut 80:19 <hr/> D <hr/> dam 18:4,12,20 26:21 28:6 43:21 43:23 damages 20:19 Dan 1:20 8:23 15:11,12,13 16:6 16:16 20:6 21:10 21:14 22:2 24:25 25:23 28:18,23 32:13 35:9 41:21 57:5 60:10 73:11 73:15 78:5,11 81:10 86:19,21 86:22 87:8 dangerous 14:13 Danville 25:20 26:9 40:6,11,20 42:6 49:17,21 50:2 56:22 57:1 57:5 data 8:6,11,24 15:10,10,12,13 15:15 19:11 25:3 46:22 59:21,22 59:24 60:4 74:11
---	---	---	--	--

76:18 78:21 82:6 85:21 90:20 91:1 91:23 date 80:24 dated 3:12 69:2 dates 40:22 82:16 day 4:9 93:14 95:19 days 9:15 94:15 deadline 91:9 dealing 82:3 December 69:2 decision 92:4 decision-maker 92:3 Defendant 1:12 1:25 2:11 define 42:18 74:14 76:24 definition 43:2 definitively 49:24 delayed 64:11 demonstrated 89:24 DeNeale 3:4,4,6,6 6:18,18,20,23,24 7:2,11 department 1:3 1:16 2:7 10:21 20:15 52:23 depending 22:13 50:14 90:9,9 deposed 5:13 deposition 1:4 3:5 3:6 4:1 5:11 6:12 6:19,20,23,24 7:12,23 9:14,17 10:15 31:4 33:15 34:1 92:14 DEQ 3:11 23:22 24:3,13,22 53:11 63:20 78:25 83:24 88:7,9 DES 9:8 describe 8:5 13:18	21:6 57:14 66:13 described 21:11 21:23 Description 3:3 desulfurization 13:25 detail 33:15 67:22 detailed 91:12 details 41:22,25 57:15 detected 41:15 60:5 detections 61:5 determined 23:15 developed 76:14 76:17 77:8 89:23 91:16 dialysis 62:19 dibromochloro... 65:9 66:22 dibromodichlor... 70:23 dictates 31:23 difference 78:10 79:17 different 18:5 22:19 23:6,7 39:14 65:3 69:22 79:14,16 80:1 difficult 79:11 dilution 78:11 86:15 diminished 83:2 directly 30:9 49:18 director 10:18,23 disagree 35:5 61:21 62:22 disagrees 92:4 discharge 9:4 13:3 16:2,11,24 17:1 17:4 21:9 23:20 24:19 28:23 30:24 32:2 35:7 40:17 53:4,10	74:21 77:3 79:15 79:18 86:20 discharged 10:1 14:3,6,7 30:22 77:5 80:12 discharges 12:10 15:11 21:14 31:10,12 32:12 32:22 35:8 36:25 37:8,19 38:21 40:9 47:14 50:3 52:4,23 53:14 69:1 72:21 84:21 discharging 15:20 28:18 disclose 52:22 disclosed 53:5,8,9 discussed 24:16 41:9 52:1 58:2 74:16 discussing 91:6 discussions 10:6 58:18 disinfectant 54:21 73:23,24 74:1,3 disinfection 50:18 59:22 68:24 distribution 39:16 42:20 45:23 55:3 55:19 Division 1:1,14 2:8 DMRs 24:20 53:4 document 6:16 27:9,15,20 59:13 59:14,18,19 61:3 63:10,18 66:2 67:12,21 68:1 69:12 72:3 76:14 76:17 documentation 88:12 documents 8:2,5 8:25 9:3,11 doing 47:24	downstream 7:17 11:23 12:12,20 16:1,24 17:1,2,4 19:12,13,22,23 20:17 21:12 25:12 26:3,16,25 27:1,15,22 33:3 34:14 37:2 40:16 41:4 43:18 44:16 45:14 51:4 54:3 57:11 72:6,12 78:2,6,16,19 81:13 84:21 86:7 87:3,9 draft 83:23 88:2 dramatically 38:17 drink 61:13 drinking 3:16 7:17 11:24 12:12 12:20 18:2,15 25:11 26:15 27:17,22 28:8 29:1,21 30:5,9 30:13 31:7 35:16 37:2,6,19 39:1 40:18 42:10 43:11 44:20 45:11 48:9 49:4 49:17 50:3,21 51:4 52:1 54:3 58:4 60:7,24 66:6 72:12 81:9 81:12 83:7 drive 38:12 driver 89:10 driving 18:18 drought 46:13 due 64:11 Duke 1:11,24 6:13 7:6,8 9:23 10:1,3 10:17,18 11:15 12:9,11,24 17:7 27:10 35:12 36:25 38:21 40:9	40:10 41:1,7 46:23 47:4,14 51:2,12,25 52:3 52:8,12,19,22 56:2,25 57:16 58:21 59:1 61:21 62:21 72:4,11,15 72:20 75:6 76:12 76:14 77:8 78:22 80:10,24 81:16 81:18 83:11 84:6 88:7 94:2 duly 5:2 duties 10:23 <hr/> E E 2:1,1 3:1 94:1,1 94:1 95:1,1 e-mail 3:19 7:3,5 68:21 earlier 21:11 30:18,20 34:19 41:9,10 43:17 46:15 51:9 54:5 54:12 64:17 65:1 69:23 73:17 74:17 81:22 83:7 83:23 86:1 90:18 earliest 88:12 early 51:6 73:13 easier 17:20 ecosystem 11:7 ED 61:3,6 67:11 91:3 Eden 3:9 16:9,10 17:2 25:20 38:18 38:23 39:2,6,13 39:14,19 40:1 52:2 54:18 55:20 56:16,21 57:9 60:8,13 61:6 63:7 64:9,9 67:12 68:25 69:18 70:7 72:9 72:16 81:18
--	--	--	---	---

87:24 88:7 Eden's 39:16 59:15 62:15 Edenton 2:9 effect 5:20 effectiveness 7:18 effects 91:21 efficiently 50:13 50:13 efforts 7:19 72:21 81:8 Eighty 41:19 either 27:7 30:14 50:12 78:13 92:3 elevated 34:15 38:11 39:10 40:6 47:12 55:2 eliminated 89:17 89:21 eliminating 55:13 55:15 emerges 33:10 34:8 emissions 83:14 Emma 7:24 employees 29:2 employment 95:15 endangered 11:10 Energy 1:11,21,24 6:13 7:8 9:23 10:1,17,19 12:10 35:12 41:1,7 46:23 47:4 51:2 51:12,25 52:3,12 52:19,22 56:25 57:16 58:21 59:1 61:21 62:21 72:4 72:11,15,20 75:6 76:12,14 77:8 78:22 80:10,24 81:17,19 83:11 94:2 Energy's 7:6 12:11,24 27:10	36:25 38:21 40:9 40:10 47:14 engaged 80:10 engineer 9:22 56:4 engineered 50:15 50:22 engineering 9:22 56:3,17 64:16 79:2,12 entailed 54:10 entered 3:4,6 54:18 enters 35:16 entirely 70:8 entities 47:5 entrance 28:23 ENVIRONME... 1:16 environmental 1:4 2:3,8 5:7 10:18 10:24 52:24 84:9 EPA 3:16 EPA's 66:5 errata 93:9 94:14 essentially 82:17 establish 20:16 estimate 81:2 evaluated 20:19 29:11,17 34:18 34:20 35:9 evaluation 3:13 63:23 event 19:12,17 events 19:20 24:16 ex 1:3,15 94:2 exact 17:11 23:3 39:16 40:22 82:16 exactly 17:13 27:7 46:1 76:24 88:17 89:2 Examination 2:19 2:21,23 5:4 85:6 90:14	example 59:20 exceedance 38:7 42:22,24 43:1,3 exceedances 37:24 38:3,22 39:19 40:19 41:12 42:11,16 43:4,8 43:14 44:5,22 45:5,9,12,16,19 48:17,25 49:11 90:17,21 91:2 Excel 8:6,9,16 exception 93:7 excess 61:14 72:9 exchange 68:21 excuse 68:7 73:12 exhibit 6:17,18,18 6:19,20,23,24 7:2,11 59:7,8,10 63:13,14,15 66:3 66:10 68:5,9,12 68:16,20,21 69:7 69:10 exhibits 68:3,11 exist 30:14 exists 30:14 expand 90:7 expenditures 57:19 expensive 76:8 81:7 experience 61:14 Expires 93:18 explain 12:17 40:15 42:16 79:17 explained 5:15 expressed 47:6,11 extend 19:23 extended 46:14 extent 31:2 33:23 34:25 56:10 83:16 external 36:20 extremely 31:20	F F 95:1 facilities 10:2 84:8 90:8 fact 51:18 78:24 factor 16:7 35:25 36:13 46:18 50:16 79:10 87:15 factors 35:21 36:2 36:8,15,16,21 37:4 facts 33:20 factual 7:16 31:6 fair 70:10 71:21 71:25 72:2 fairly 43:21 73:25 79:8 89:21 fall 11:21,24 63:19 82:13,17 familiar 19:3 20:11 32:1 59:18 62:25 familiarize 68:10 far 8:13 16:16,18 16:19 19:23 31:14 43:18 45:2 87:9 FEAR 1:8 February 1:7 4:9 91:14 95:19 federal 92:5 federally 65:19 feed 64:12,13,21 feel 66:7 FGD 13:24 14:1,2 53:19,21,22 79:21 field 79:5 89:22,22 90:1 figure 87:3 file 20:18 91:13,14 91:15 92:8,8 files 7:25 9:1	financial 95:16 find 93:3 94:8 finding 77:7 findings 87:24 fine 17:22 27:8 firms 56:3 first 7:5 8:13 39:24 44:17,20 51:2,12,14,25 52:3,22 70:21,24 fish 62:19 five 15:14 17:8 18:14,21 19:20 19:21,21 fix 63:6 flipped 56:8 flow 21:14 33:2 49:19 86:22 flows 20:8 flue 13:24,24 53:20 flush 58:12 flushed 58:7 flushing 58:25,25 fold 23:8 folks 79:2 follow-up 83:6 follows 5:3 Ford 18:3,12 28:6 foregoing 93:1 95:8,10 fork 18:24,25 form 12:14,25 13:19 23:17 26:7 30:3 31:1,13,18 32:14,21 33:5,13 34:17,24 35:15 35:19,24 36:7 37:3,11,15,22 38:24 40:12 41:6 45:22 46:25 50:6 51:5 52:6 53:7 53:16 54:6,15 58:5 59:20 60:9 61:7,23 62:23
--	--	--	---	---

63:3 65:21,25 70:12,18 71:1,5 71:12 72:1,7,23 76:16 77:12 81:3 81:21 83:15 84:1 84:15,18,24 89:13 94:12 formation 35:17 36:3,6,17 37:1 37:20 48:9 50:5 50:17 91:22 formations 55:3 forward 7:6 found 82:7,23 FOUNDATION 1:8,19 four 19:13,20 60:17,18 65:3,13 65:14,22,24 67:11 68:7 69:22 frame 17:11,12 21:19 29:8 38:6 39:18,21 42:13 44:25 45:1 46:7 47:8,9,25 51:7 52:7 53:23 70:2 70:2,21,25 71:23 73:13 82:10,19 88:4 frames 92:7 Francisco 2:6 free 66:7 French 8:24 19:10 20:6 78:12 86:12 frequent 86:4 frequently 63:25 front 78:13 fuel 74:6 fulfilled 72:18 full 6:8 function 50:10 78:10 86:23 funded 57:16 funding 56:2,25 58:21 59:2 72:5	72:16 fundings 72:11 furnish 94:13 further 4:11 40:16 92:10,11,13 95:12,14 <hr/> G <hr/> Gaffney 27:4,5 45:8 gas 13:24,24 53:20 76:8 89:17,18 Gastonia 28:10 49:7 58:11 gauge 18:9 gears 12:10 42:9 general 1:1,13 25:8 30:8 40:25 81:6 92:6 generally 22:11,15 23:18 36:4 39:14 generate 89:17 generated 68:24 68:25 89:4 generation 76:4,6 genesis 87:25 geography 19:3 Gervin 4:5 95:4 95:23 gestures 6:1 getting 18:19 33:9 33:16 56:19 61:17 68:7 give 5:24 6:8 given 5:21 43:2 91:20,22 93:6 giving 6:12 87:20 go 8:13 13:23 18:12 20:2,3,6,7 20:9 23:3 26:20 28:1,5 32:4 36:2 48:18 53:19 61:20 67:6,22 83:3 84:23 86:3 92:5	goal 66:17 goals 65:23 66:14 67:1 Godreau 68:23 goes 49:4 53:22 77:4 going 6:16 10:7 12:9 23:10 26:17 37:18,23 40:13 40:15 44:7 52:25 59:7 63:10 66:8 68:2 79:6,20,23 80:2 88:10 89:2 89:4,7 90:3 good 46:13 59:4 73:24 86:14 89:20 government 5:1 GPS 23:2 graphs 71:22 great 33:15 greater 86:21 90:25 group 9:23 11:6,9 11:25 17:10 47:4 55:9 57:18 65:2 65:3 81:23 82:5 82:8 84:8 groups 5:8 11:13 12:1 62:17,25 guess 30:8,13 31:5 33:9 39:13 44:7 55:11 59:8 68:15 70:10 <hr/> H <hr/> H 3:1 94:1 half 16:18 91:23 halfway 32:19,23 halide 80:7,22 83:13,22,25 84:13 88:23 halides 79:4,7,9 79:25 80:5 Hall 1:5 4:2 5:1,5	33:17 59:8,10 63:13,15 66:3,10 68:12 90:11 93:12 94:5 halogen 36:23 50:11,15 75:12 84:19 85:24 90:25 halogenated 84:7 84:10 halogens 35:21 36:18,19 50:19 75:21 79:4 hand 6:16 59:7 63:10 66:2 68:2 95:19 handy 32:5 Hang 25:10 harm 14:14 Hazen 64:17 heading 64:8 headwaters 21:13 health 11:7 37:9 held 82:4 help 10:10 66:2 helping 79:12 helps 47:23 hereunto 95:18 high 61:8,8,9 62:4 high-quality 62:21 higher 75:21 78:16 86:11,14 higher-halogen 81:7 highly 31:19 highs 87:20 Hill 2:4 26:20 28:2 42:10 43:9,18,20 57:11 81:20 82:8 hired 11:21 Holly 28:11 49:14 58:11 hope 65:6 hot 46:14,15,16	humans 14:14 hundred 37:16 86:9 87:2 Hunton 2:12 4:7 Hycos 30:5,10 <hr/> I <hr/> identification 5:2 6:21,25 59:11 63:16 66:11 68:13 identified 74:18 identify 15:22 63:18 68:19 75:1 immediately 16:1 impact 12:19,22 18:9 impacts 12:23 18:22 implementation 80:23 implemented 90:1 90:3 in-house 11:12 in-stream 14:25 15:3,5,7 inaudible 67:19 include 22:2,22 69:14 87:5 88:20 included 22:18,21 24:9,10 64:19 includes 24:5 87:4 including 7:18 58:6 inclusion 23:4 87:22 inclusive 93:3 increase 37:5 46:17 48:4,7,23 70:1 84:13,21 87:6,10,11 increased 37:7 48:2,8 55:1 61:16 70:3,16 71:11,24,25
---	--	--	--	---

84:19 increases 44:8 45:20 47:15 49:8 50:9 70:24 71:4 increasing 46:20 individual 10:3 11:3 65:19 66:13 67:14 individuals 51:20 industries 74:21 76:19 77:2 industry 73:25 74:19 influence 77:18 influenced 16:19 information 7:16 31:6 94:14 initially 47:3 85:16,16 install 38:11 51:8 81:9 installation 53:24 54:1 installed 39:3 53:21 54:14 56:23 installing 54:20,21 instance 73:1 76:21 institute 79:6 instituted 75:3 instruct 10:7 intake 15:17 18:3 18:16 26:1,1,6,9 26:13 28:2,5,7,8 28:24 29:2,17,22 29:23,23,24 30:1 30:5,9,13,16 35:16 40:6,18,20 41:8,20 42:1,4,7 42:10 43:12 44:4 44:20 45:8,11,18 46:21 47:13,16 48:16,21 49:6,7 49:17,21 50:3,5	55:14 58:15,24 60:8,10,10 81:9 81:20 83:7,8 intakes 7:17 11:24 12:13,20 18:18 25:11 26:16 27:17,23 28:3 29:10,21 31:7 37:2,19 41:4 43:20 48:19 51:4 52:1 54:4 58:4 72:13 81:13 intent 91:13 92:8 interest 95:16 interpretation 70:13 intersects 32:18 Intervenors 2:3 introduced 6:17 investigated 46:24 involved 88:8 Island 18:13,14,20 28:7 issue 46:4 51:11 51:13 75:5,9 82:1,8 issued 4:2 5:1 53:2 83:24 issues 3:21 11:11 30:2 44:15 64:12 64:13,21 69:5,11 75:7 81:17,19 83:22 84:14 italics 61:19 <hr/> J <hr/> January 10:22 11:16 51:9 88:15 Jessica 68:23 judge 92:5 June 56:20 Justice 1:1,13 2:7 20:15 <hr/> K <hr/>	keep 42:20 52:15 89:12 keeping 89:1 Kennedy 9:20,21 10:6,9 kept 41:1,7 Kerr 20:6 21:13 26:1,13 kidney 62:19 kidneys 61:15 kind 7:25 12:17 15:22 19:3,11,24 20:7,8 21:22 22:8 25:13,24 28:1 36:13 52:10 60:22 61:19 67:12,21 68:23 70:8 71:22 72:18 73:2 74:23,25 75:8 77:6,14 82:18 84:9 85:23 88:12 89:8 90:1 90:24 92:1 kinetic 36:12 know 6:4 8:17 12:21 15:16,22 15:23 16:6 18:16 26:2,17,25 29:4 29:19,25 30:1,4 30:19 31:15,17 32:6,19 33:6 37:17 38:8 39:8 39:16,18,23 40:2 40:3,4,22 41:14 41:22 42:6,13 43:2 44:15 45:25 46:1,1,4,6 50:8 50:19 51:15 53:8 53:11,13 56:13 56:18,22 57:15 57:15,16,22 58:1 58:6,13 59:8 60:7,18,22 61:24 64:12,19,21 67:5 67:20 68:9 71:22	73:2,14 74:24 75:7,16 76:21,25 77:6 79:23 80:23 80:25 81:4 82:7 83:8,10,20 84:9 85:21 86:23 87:4 87:25 88:1,3,16 88:17,19 91:15 91:17,20 92:2 knowledge 50:20 known 6:12 knows 34:2 83:19 <hr/> L <hr/> labeled 60:22,23 69:4 laboratory 11:13 11:19 89:25 laid 23:22 48:19 Lake 17:24 18:6 18:13,14,21 26:1 26:13 29:2,22 30:1,6,10,14 83:7 landfill 89:7,10 Langley 35:1 83:18 Langley's 31:4 33:14 34:1 large 50:16 late 51:6 Law 2:3 5:7 laying 33:21 layout 32:1 leachate 89:8 lead 35:17 36:5 55:2,6 leading 32:10 learned 67:15 led 73:19 74:16 88:6,9 legitimate 75:6 let's 19:13 42:18 77:18 Letter 3:11	letting 89:13 level 65:23 66:14 77:9,11 89:25 levels 34:15 40:6 40:11 41:2,3,8 41:14 44:13 65:18 69:20,21 70:14 78:11 85:24 light 53:6 limit 14:12,21 37:17 41:17 limited 8:23 line 20:8 94:9,16 94:18,20,22,24 lines 26:2 liquid 79:14,18 list 25:13 27:22 76:14 94:8 listed 7:7 14:16,18 27:9 59:23 61:3 64:13 66:18,21 67:12 lists 27:15 66:5 liter 66:23 little 12:17 22:24 67:7,22 71:14 78:16 86:22 liver 61:15 LLC 1:11,24 94:3 LLP 2:12 4:7 loading 16:7 located 43:21 83:9 87:14 location 16:15,17 22:17 23:2 33:6 33:9 35:10 49:2 58:15 62:3 locations 17:8 18:14,21 19:13 19:21,22 21:7,24 22:18 23:25 33:24 41:8 60:17 60:19 85:12,14 long 10:20 17:7
--	---	---	--	---

46:14 56:18 91:20,22 longer 51:18 look 7:2,10 15:23 23:24 35:2 49:23 59:9 62:1,10 64:6 66:7 69:10 69:11 71:7 82:16 looked 34:19 61:10 74:13 75:1 88:16 looking 62:11 69:25 70:7 74:11 76:13 looks 19:4 68:21 lost 22:24 lot 36:2 71:25 74:11 86:19 low 62:1 78:12 low- 75:11 low-halogen 73:7 lower-halogen 74:5 75:13,14,16 75:22 81:1,6 lows 87:21 Lugoff 44:2 Lugoff-Elgin 20:5 20:5 26:22 44:3 44:4,11	main 18:15 28:8 making 94:11 managed 11:19 manifesting 48:8 manufacturers 77:2 map 32:5,9 49:18 49:19,23,25 marked 59:7 Marshall 13:10 18:9 19:7 27:22 45:14 47:15,19 MATS 47:24 matter 5:8 78:24 Matthews 46:2 49:2 maximum 65:18 65:23 66:13 Mayo 13:12 21:7 28:13,18 29:2,3 29:22 30:1,14 41:20 42:1 49:16 50:4,24 78:20 83:7,9 87:4,5,8 Mayodan 25:18 26:6,8 41:13,20 mblake@selcnc.... 2:5 McGuire 18:4 MCL 61:2,14 66:17 67:1 MCLs 66:6 mean 12:16 15:5 20:2 22:18 35:5 35:21 42:16 48:3 54:24 57:4 60:11 76:4,20 77:14,14 80:1,19 85:16 meaning 12:18 means 47:20 70:9 meant 15:7 measures 42:19 Mecklenburg 1:2 1:14 95:3,6 meet 10:12 47:5	47:24 meeting 10:8 47:11 81:22 82:5 82:7,9,10 meetings 82:11,14 82:23 Melissa 2:11 7:24 mentioned 16:22 20:11 25:11 38:18 51:9 64:14 64:16 65:1 73:17 81:22 85:8 86:10 88:24 mercury 47:24 83:13 met 5:5 methods 80:11 mid-Appalachian 75:19 middle 82:19 mile 16:18 miles 16:2,4 43:24 45:4 milligrams 66:23 million 72:10 mind 52:15 mispronounce 44:2 missed 86:11 missing 26:24 28:14,14 misunderstandi... 48:19 mixes 36:5 moment 5:5 25:10 32:6 49:25 50:1 59:4 monies 57:7 monitor 14:19,21 20:20 91:25 monitoring 14:22 14:25 16:4 17:14 18:5 21:11 24:20 88:11 monthly 85:18	months 85:25 Mooreville 18:2 18:2,3 27:24 45:15 Mount 28:11 49:14 58:11 Mountain 18:13 18:14,20 28:6 MOUNTAINT... 1:20 mromanzo@hu... 2:14 multimunicipality 25:25 multiple 8:19 64:1 87:13 municipal 18:18 29:21,23 37:6 54:8 74:20 76:18 77:1,4 81:9 87:13 municipalities 20:17,23,24 21:1 28:19,22 44:14 56:3 58:6 67:10 67:16 75:4 77:3 82:3 83:1 91:6,9 91:12,18 municipality 50:12 Myra 2:3 5:5 15:14 17:13 27:6 38:9 49:24	77:14 78:15 NC 1:8 near 18:1,1,15 20:5 21:7,12 22:2 60:10 62:3 77:23 90:21 necessarily 32:5 43:1 44:13 53:20 necessary 32:7 94:13 need 5:24 17:9 22:13 29:14 49:23,23 62:18 63:1 86:3 94:9 nervous 61:16 new 8:11 81:9,12 Ninety 86:9 nods 5:25 nonroutine 24:15 Norman 17:24 18:6 North 1:1,3,3,13 1:15,16 2:4,7,9 2:13 4:4,8 20:7 25:25 52:23 68:22 94:2 95:2 95:6 northern 17:24 northwest 20:9 32:11 NOS 94:4 Notary 4:6 93:17 95:5,24 note 61:11 66:8,13 Notice 4:2 notification 20:2 20:12 21:4 88:9 notifications 20:22,23 notified 26:3 75:3 84:10 notifying 20:24 November 91:13 92:8 NPDES 9:7 14:16
<hr/> M <hr/> M-a-y-o-d-a-n 25:18 Madison 15:25 17:2,5 25:16 37:21,23 38:7,10 39:3,11,12,20 40:3 41:24 42:2 42:3 51:8,24 52:2 54:11,16 55:12,14 57:9 69:17 70:2 72:8 72:16 81:18 87:24 88:7,15 90:24				
			<hr/> N <hr/> N 2:1 N.P 95:23 name 5:5 8:16,18 65:15 80:4 national 3:16 66:5 Nationally 4:6 95:4 natural 1:16 11:9 naturally 13:20,22 73:4 76:20,23	

15:21 53:1 63:21 87:23 88:20 NPDS 9:6 Nuclear 73:22 number 3:3 6:20 6:24 28:2,5,7 59:10 63:15 66:7 66:10 94:9 numbers 60:16 68:12 73:2 82:25	78:15 occurs 14:24 17:3 23:25 33:2 36:14 October 53:2 63:19 Office 2:8 offices 4:7 Oh 33:7 61:19 okay 5:9 6:3,7,11 6:22 7:1,2,10,14 7:22 8:2,19,25 9:16 10:3,11 11:6,15,23 12:7 12:16,23 13:4,16 14:7,22,25 15:3 15:7 16:12,21 17:3,7,14,18,22 17:23,25 18:8,11 18:12,18 19:5,15 19:23 20:11,21 21:6,17 22:1,12 22:14 23:12,24 24:5,15,21,24 25:2,4,10,17,19 25:22 26:5,11,15 26:23 27:3,8,15 27:19,21,25 28:4 28:9,13,17,21 29:1,6,10,22 30:1,5,13,18 31:5 32:4,18 33:1,7 34:4,12 34:18,22 35:5,12 36:4,11,16,25 37:9,14,18 38:2 38:5 39:1,5,13 39:18 40:9,14,19 40:25 41:7,11,18 42:2,6,9,15 43:2 43:8,11,14,17,22 43:25 44:4,7,16 44:25 45:2,8,11 45:14 46:3,9,11 46:15,19,23 47:2 47:8,10,14,18	48:5,16,25 49:3 49:5,7,11,16,22 49:25 50:24 51:2 51:12,20,24 52:3 52:8,12,22 53:5 53:13 54:2,10,17 54:19 55:5,11,16 55:25 56:10,22 57:3,6,11,22 58:1,9 59:12,24 60:7,21 61:2,10 62:6 63:5,10,12 63:13,22,25 64:4 64:6,24 65:6,11 65:15,18,23 66:13,22 67:4,13 67:15,24 68:1,14 68:15,18 69:2,7 69:10,20 70:5,14 70:20,23 71:7,14 71:21 72:3,11,15 72:20,25 74:8 75:10,24 76:7,12 77:8,17,21 78:1 78:4,9,19,22 79:1,13,17,22 80:2,4,8,10,17 80:22 81:5,8,12 81:16,24 82:9,12 82:15,20,22 83:3 83:11 84:3,12 85:1,3,5 86:16 87:16,19 89:12 89:15 91:5 92:10 once 26:20 48:10 53:21 59:8 64:1 68:9 81:25 85:25 ones 26:3 58:2 65:15 ongoing 8:12 86:5 open 82:2 operable 55:24 56:7,15 operate 87:8 operated 50:11,14	operates 50:12 operations 13:1 13:17 16:20 20:18 77:22 78:2 opinion 11:3 options 89:16 order 15:22 31:21 60:15 67:22 85:12 organic 35:25 organization 11:14 12:6 origins 31:8 outfall 14:23,24 73:12 78:14 outfalls 14:6,10 outlined 41:10 73:3 75:5 78:24 outside 14:20 24:18 overchlorination 35:23 owners 62:20	41:20 45:23 50:21 51:17 54:22 62:3 69:12 70:17,20 71:25 87:12 particularly 67:9 parties 4:4,12 56:1 95:15 partner 82:4 partnered 79:2 parts 41:19 42:9 42:23 77:25 78:3 78:6,13,17 86:2 87:2 party 92:4 patient 62:19 paucity 19:11 85:21 people 39:22 40:1 42:6 51:16 61:13 percent 37:16 48:3,14,15 55:18 71:15,18 73:14 percentage 71:10 86:20 period 8:10 periods 46:14 permit 9:6,7,9,10 15:21 23:16 52:16 53:1,2,10 63:20 83:12,16 83:21,23 87:23 88:2,4,11 permits 9:4 14:17 14:18 88:20 permitted 42:1 personal 34:3 persons 95:12 phone 10:14 phrase 6:5 picture 25:8 49:18 pie 71:8 pipe 24:22 31:12 32:9,18 33:3,11 34:9,15,23,25
O oath 5:18 objection 12:14 12:25 13:19 23:17 26:7 30:3 31:1,13,18 32:14 32:21,24 33:5,13 34:17,24 35:15 35:19 36:7 37:3 37:11,15,22 38:24 40:12 41:6 45:22 46:25 50:6 51:5 52:6 53:7 53:16 54:6,15 58:5 60:9 61:7 61:23 62:23 63:3 65:21,25 70:12 70:18 71:1,5,12 72:1,7,23 76:16 77:10,12 81:3,21 83:15 84:1,15,18 84:22,24 obligation 24:17 obligations 23:23 24:8 47:25 observed 59:6 83:5 obviously 88:7 89:7 occur 14:23 occurred 39:19 occurring 17:15 17:16,17 76:20 76:23 77:14			P P 2:1,1 P.M 92:15 page 3:2 7:5,14 59:25 61:11 64:6 66:4,9 69:11,14 71:7,8 94:9,16 94:18,20,22,24 pages 2:18 93:2 94:12 95:10 paragraph 62:10 parameters 23:22 part 20:14 22:8 24:7 26:4 27:11 29:11 47:5 48:18 56:16 70:15 78:7 85:9 particular 8:1,3,9 8:18 21:15 24:6 29:17 34:13,22 37:18 38:14	

35:2,7 place 56:7,14,15 88:5 95:9 Plaintiff 1:5,17 2:6 Plaintiff's 3:2 Plaintiff- 2:2 Plaintiff-Interv... 1:9,22 Plaintiff/Interve... 4:3 plan 21:11 89:25 plans 23:21,24 35:12 74:16 90:7 plant 13:1,17,21 15:8 16:10,19 18:4 29:3 30:11 49:4 54:9 69:1 77:4 plants 7:18 21:14 48:10 74:4,20 76:19 77:1 81:13 87:14 90:22 Plaza 2:12 plea 8:14 20:14 21:20,24 27:12 29:20 48:11 75:2 85:17 please 6:4 12:17 94:7,11,13,14 point 14:11 15:25 16:4,8,9,21,25 17:1,4 18:24 23:4 35:6 42:23 42:25 45:23,25 46:5 49:2 61:5 61:25 64:22 67:7 76:18 79:5 87:10 87:12 points 8:6 15:14 19:25 22:4,5,7 42:19,21 85:10 pond 62:20 position 10:17,20 10:22 11:18,20	positive 91:1,2 possible 78:23 82:2 Post 2:8 potential 18:22 50:25 75:4 76:15 77:23 potentially 40:13 50:7,23 51:1 POTW 74:22 77:3 Powder 75:20 power 29:3 69:1 ppb 87:11 precautions 62:18 63:1 preferentially 73:7 74:5 75:15 75:22 preparation 51:15 prepare 7:22 10:10 prepared 7:20 preparing 9:13 10:15 presence 13:17 35:10 present 10:9 13:20 13:22,25 14:1,4 31:17,22,23,24 36:5 53:14,17 60:4 73:4 77:15 77:18 95:13 presented 6:21,25 7:11 59:11 63:16 66:11 68:13 presumably 68:25 74:21 77:1 pretty 46:13,13 87:9 89:18 91:1 previous 6:17 9:9 88:4 Previously 3:4,6 primary 3:16 10:3 10:5 66:5 prior 11:15 47:22	51:10 53:5,8,9 53:12 84:10 88:14 privilege 29:14,16 probably 9:15 16:3 17:20 19:13 40:24 problems 37:10 61:15 Procedure 4:5 proceedings 95:11 process 5:11,15 13:23 20:1,12,17 20:25 26:4,18 27:12 29:11,18 47:23 53:19 54:1 54:20 73:19 75:3 75:5 79:24 80:5 82:24 84:6 85:23 91:5,10,11,16,19 91:24 92:1 produced 5:1 progress 1:11 63:22 64:4,8 94:3 project 64:11,11 79:6 pronouncing 65:6 proposal 84:13 proposed 81:12 provide 72:16 provided 56:25 58:21 59:1 72:12 72:17 providing 56:2 public 4:6 29:23 40:23 68:22 93:17 95:5,24 publicly 26:19 27:13 46:22,22 pulled 13:23 pulls 30:10 purchase 41:24 purpose 22:19,20 23:6,8,8	purposes 23:19 pursuing 63:7 purview 11:25 put 53:3 56:14 58:16 66:3 putting 7:6 <hr/> Q <hr/> quality 1:4 3:8 11:7,25 12:5 52:17,24 59:16 quantities 14:14 quarter 42:25 46:10 quarterly 22:11 22:15 60:17 question 6:3 12:17 29:13,15,16 31:9 34:6,7 35:9 39:24 40:25 44:15 50:22 51:16 57:10 questions 5:10,25 11:4 16:12 25:5 83:6 85:1,4 90:12,15 92:10 92:11,13 quick 59:5 89:18 quicker 36:14 quickly 89:21 quite 40:15 74:1 83:1 <hr/> R <hr/> R 2:1 94:1,1 95:1 radar 52:18 raise 84:12 Raleigh 2:9 range 19:24 60:4 62:1,8,9 77:9,25 78:3,6,8,13,18 86:2,17 87:18 rare 11:10 reaches 17:24 reaction 36:14,18	36:21 38:14 reactive 47:23 read 56:1 93:1 94:7,17,19,21,23 94:25 ready 79:5 real 88:25 really 74:14,24 90:2 reason 6:7 31:16 31:19 50:8 61:21 62:22 67:16 Rebekah 4:5 95:4 95:23 recall 90:18 receipt 94:15 receiving 15:6 recess 59:6 83:5 recognize 59:13 63:14 recollection 66:25 record 40:23 63:18 68:19 83:3 88:6 recorded 6:1 records 41:1,7 reduce 7:19 56:10 58:8 72:21 74:6 reduced 48:13 73:13 reducing 55:17,23 reduction 3:13 55:18 63:23 73:20 reductions 73:15 refer 80:7 reference 3:3 49:19 referred 54:14 referring 43:4 refined 82:24 85:23 90:23 refining 47:19 48:1,10 73:18,18 refresh 66:2,25
--	---	---	---	--

regard 84:14	represent 5:7 66:4	river 1:8,8,20,21	46:1 48:14	90:20
regarding 7:16	requesting 83:12	8:23,23 14:23	routine 18:5 21:11	satisfying 63:20
31:5,6 90:16	required 14:19,19	15:11,12,13 16:2	21:21 22:1,4,5,8	Sawyer 64:17
Regardless 49:6	24:7 75:2	16:4,16 18:20	22:10,16,25 23:7	saying 37:23
regards 8:7 12:19	requirement	22:2,21 23:1	23:12 24:2 85:9	says 61:12 62:2,17
75:9	63:20 72:19	28:23 32:13 35:9	85:10	64:9
regime 86:23	requirements 22:9	41:21 42:1 48:7	routinely 15:15	scale 89:25
regimen 86:5	reserved 4:14	48:15,24 57:5	18:6	scenario 74:24
Reginald 3:11	reservoir 20:4,6	60:11 73:11,16	Roxboro 13:14	science 10:18,24
regional 26:1,13	21:13 22:22	73:21 74:7 75:21	21:7 28:18 30:6	SCOTT 1:5 4:2
regulated 15:19	resolved 64:22	78:14 81:10 85:7	30:8 49:16 50:4	5:1 93:12 94:5
37:13 52:16	resources 1:16	Riverbend 19:8	50:24 78:20 87:4	scrubbed 20:18
65:14 67:9,11	11:6,9 12:6	RIVERKEEPER	87:5,8	scrubber 14:2
74:14	response 7:4,15	1:19,20	Rules 4:5	53:19,21,23,24
regulations 3:17	12:8 16:23 32:15	rivers 1:7,7 13:2	run 73:7 74:5,5	54:1 79:21
66:6	39:12 44:19,21	ROANOKE 1:8	75:19,22	seam 75:20,23
regulatory 14:12	62:13 64:7 69:13	1:20	running 42:20	seasonal 91:21
23:19,23 24:8,17	90:6	Rock 26:20 28:2	73:9 75:11,20	second 29:12 64:6
37:17	responses 5:25	42:10 43:9,18,20	76:2,9 77:15	66:9 83:4
reimbursement	43:6	57:11 81:20 82:8	81:1 86:25	section 27:11
75:6	responsibilities	Romanzo 2:11,23	runs 86:24,25	59:21 68:22
reject 89:5	9:24	10:7 11:1 12:14	<hr/> S <hr/>	see 7:6 8:1 15:9,24
rel 1:3,15 94:2	responsibility	12:25 13:19	S 2:1 3:1 94:1	17:18 19:13
relate 79:13	9:25 10:4	23:17 26:7 29:13	salts 83:13,25	23:25 25:15 26:5
related 30:2 75:7	restate 31:9	30:3 31:1,13,18	84:13	29:22 32:9 46:6
relates 83:21	result 95:17	32:14,21,24 33:5	saltwater 76:21	46:15 48:22
relation 83:9	results 24:2,5	33:13,23 34:17	sample 17:23 18:1	61:11,17,20
remain 78:12	return 94:9,14	34:24 35:15,19	21:23	66:12 87:9
remains 56:11	reveal 10:8	36:7 37:3,11,15	sampled 19:25	seeing 68:18
remember 17:11	review 4:12 8:2,25	37:22 38:24	60:8,13 85:15	seek 75:6
17:12 24:17	9:8 84:9	40:12 41:6 45:22	samples 18:7	seen 37:4,5 56:11
25:15 26:17 27:6	reviewed 9:4	46:25 50:6 51:5	21:10,12,16	59:14,18,19,21
28:16 38:13 73:3	right 7:13 11:5	52:6 53:7,16	22:10,16,17,19	67:3 68:15 73:2
86:16 91:6	23:10,13 27:7,19	54:6,15 58:5	22:25 23:7,12	73:15 86:18 88:8
remove 79:24	28:16 29:6 33:4	60:9 61:7,23	24:21,25 60:17	88:13 91:3
removing 79:7	33:12 35:22	62:23 63:3 65:21	sampling 15:25	seep 33:25
80:5,11	38:19 39:2 40:7	65:25 70:12,18	16:8,9,15,21	seepage 33:1,19
reorganized 10:21	41:13 60:1,25	71:1,5,12 72:1,7	17:3,7 18:24	seeps 30:24 31:11
report 3:8,14	61:3 62:8 65:4,7	72:23 76:16	19:12,15,17,19	31:14,17,22 33:6
14:21 24:20	66:18 68:19 69:5	77:10,12 81:3,21	19:25 21:7 22:1	33:10 34:20,22
59:16 63:22 64:4	69:18 70:21,25	83:15 84:1,15,18	22:2,4,5,7,8	35:13
64:8 88:11	71:11,16,19	84:22,24 90:14	23:13 24:10,15	Semi- 3:13
Reporter 4:6 68:6	75:20 79:19	92:10	42:25 74:16 85:7	semiannual 63:22
95:5	85:17 87:21	Rosemary 2:4	85:9,11 86:5	63:25 78:25
reports 63:25	risk 61:16	roughly 44:1 45:4		semiannually 64:3

Sent 91:16	site 13:4,6,8,10,12	86:18	17:18 53:14 54:4	submission 24:11
sentence 62:11,17	13:14 15:1 17:19	south 2:13 4:7	55:12 68:15 70:1	submit 91:25
separate 23:10	19:1,2,7,14,19	18:24,25 25:23	70:3 71:4,23	submittal 63:19
sequester 47:24	22:3 25:12 26:16	25:24 26:11	state 1:1,3,13,15	78:25
79:3,24 89:9	28:13 30:6,8	Southern 1:21 2:3	42:10 77:15,18	submitted 23:21
sequestered 89:1	32:2 39:19 43:19	5:6	88:13 94:2 95:2	24:2,20,22,23
Sequestering 79:9	43:23 44:9,17	space 33:1 34:13	95:6	25:3 64:1 83:12
sequestration	45:3,14 50:24	sparge 38:12 39:3	stated 34:19 95:13	88:1
80:7,22 88:23	53:15 54:4,11	51:8	statement 61:17	subscribed 93:13
series 82:11	57:11 58:19 76:1	speak 9:16 10:14	61:22 62:22 72:2	subsequent 48:12
serve 40:1	sites 8:19,21 17:16	90:2	Station 9:5 18:10	53:2
served 29:2	17:17 21:8,9	special 62:18 63:1	18:23 38:1,3	subsequently
serves 42:7	30:23 49:16	specialized 21:23	63:21 73:6,22	48:13 53:3 73:15
set 18:16 63:11	53:25 77:9 78:20	62:20	83:14,25	85:22
64:24 65:18 68:1	79:15	species 11:11 37:5	stations 18:6	substantially 48:2
72:3 74:25 84:6	sitting 28:14	specific 23:25	Steam 9:4 18:10	48:3
95:18	slightly 72:9	47:12 50:17	18:23 37:25 38:2	success 90:9,10
settlement 57:4	sluicing 79:19	76:17 91:11	63:21 73:6 83:14	successful 55:13
setup 39:16	Smith 16:5,21	specifically 8:8	83:25	55:17,22 90:8
seven 72:8	sole 37:24	29:20 41:16	steps 73:5,10	Suite 2:4,12 4:8
Shannon 31:4	solely 35:24	51:21 57:8 74:20	74:18 75:8,11	sum 84:17
33:14 34:1 83:18	solidify 89:9,12	87:24	stipulated 4:11	summarizing
share 41:23	solubility 31:23	speculating 16:3	29:21	68:24
shared 82:6	79:10	29:9 40:21 49:20	stipulation 20:16	summary 3:21
sheet 93:9 94:14	soluble 14:4 31:20	speculation 56:16	Stokes 81:8	69:4,10
Shelby 27:4 44:17	31:21 88:25	spelled 26:18	stopped 19:25	summation 65:22
45:2,6 58:15,19	solution 47:21	spend 9:13	20:1 29:7	67:11
58:22	79:3 89:20	spent 72:4 80:24	storage 38:11	summer 8:15
shifting 42:9	somebody 62:3	spikes 77:23	Stowe 51:21	82:18
show 71:22	sorry 22:24 27:6	spill 57:5	straightforward	SUPERIOR 1:1
showing 69:15	28:16 29:9 31:9	spoke 9:20	79:8	1:14
70:10 71:9 83:1	32:16 33:6 39:24	spot 23:1,3	strategic 9:22	supplemental
shown 12:19,21	41:2 43:17 48:18	spreadsheet 8:6,9	stream 53:20,22	94:12
34:13,15	60:12 61:18 80:2	8:16,17	79:4,8,25 80:6	supplies 72:6
side 32:11 68:8,8	80:19 83:10	spring 85:18	89:3,4	supply 41:4 62:15
SIERRA 1:7	sort 32:11 41:24	stabilized 86:2	Street 2:4,9,13 4:8	support 23:18,23
signed 8:14 20:15	89:4,5	standard 24:18	structure 35:7	92:2
48:11 51:9 56:20	sound 1:7 29:6	52:17	studies 57:18	sure 5:10,12 6:6
88:15	sounded 80:19	standards 40:20	78:22 80:10,22	10:25 13:20
significantly	source 31:8 54:23	start 5:10 11:20	89:22	16:14 21:9 25:6
70:24	55:1 57:20 78:23	77:18	study 23:21,24	25:9,13 30:21
signing 4:13 21:20	sourced 75:17	started 17:10	80:9 88:23	32:8 33:23 37:16
21:24 85:17	sources 15:18,23	21:20,24 57:12	stuff 21:21,22	67:20 68:4,21
simply 86:15	16:6 40:17 74:19	58:25 74:10,14	subcomponents	70:9 79:18 85:5
single 39:15	76:13,15 77:24	starting 16:15	65:19	90:13

surface 11:7,8,25 12:5 15:6 17:14 30:10,23,25 33:25 34:22 52:17 susceptible 50:18 54:23,24 switch 56:8 switched 74:2 85:25 Switching 12:10 sworn 5:2 93:13 system 13:24,25 38:12,16 39:4,17 42:18,20 45:24 48:21 49:1,8,12 50:11,12,14,15 50:21 54:21,22 54:22 55:2,4,19 55:22 56:6,13,14 56:22 57:8,21 58:8 60:11,14,24 62:15 74:23 systems 50:18 51:8 54:13 55:12 56:5 61:16 74:15	90:17,18 talks 62:14,16 tanks 38:11 39:1 39:10,14 54:14 tbenzoni@ncdo... 2:10 team 79:12 tell 9:3 34:2 37:12 temperature 36:13,21 46:16 temporal 70:10 ten 18:5 86:9 87:2 term 20:11 terms 29:18 83:16 87:22 92:7 terrestrial 11:10 test 35:12 tested 31:14 testified 5:2 30:18 33:17 35:1 88:24 testify 7:7,20 31:2 87:3 testifying 83:22 testimony 5:20 6:8,13 12:9 30:20 35:3 93:6 testing 23:25 24:2 tests 34:12 thank 9:8 12:7 25:4 68:1,8 72:3 74:8 90:11 thereof 95:17 thermal 23:20 thing 41:19 66:8 71:3 90:13 things 11:9 77:15 80:1 90:16 think 15:14 16:2,5 22:24 25:7,7 28:11 35:1,5 37:16 40:21,23 41:16 46:15 49:20 54:4,11 56:8 64:17,25 67:17 71:9 72:2	82:13 86:10 thinking 28:14 third 46:10 thirty 94:15 THM 82:25 91:21 THMs 37:5 thought 15:7 51:15 threatened 11:10 three 11:13 26:24 62:17 76:22 82:14 85:25 time 8:9,14 9:13 17:8,11,12 21:2 21:19 22:17,22 23:3 29:7 36:1 36:12,22 38:6 39:18,21 41:3 42:13 44:25 45:1 46:6 47:8,9,25 51:6 52:7,11,20 53:5,23 55:11 60:8 67:6,19 70:1,1,2,21,21 70:24,25 71:23 73:13 82:9,18 88:4 91:22 92:7 95:9 times 60:7,13 64:1 76:22 to-2012 39:21 TOC 36:10 today 5:18,22 6:9 7:20,23 27:20 85:2 88:8 told 38:13 73:4 topic 7:8,10,16,20 8:1 11:2 31:3,5 total 35:25 36:18 60:2 61:2 69:25 72:17,18 87:16 totally 80:1 touched 54:5 tough 15:20 75:18 towers 74:1,3	town 15:25 16:8,9 25:18,20 37:21 38:7,10 40:3 56:21 68:25 69:17 toxic 83:13 toxicity 89:18 toxicologist 37:12 61:24 track 44:13 traditionally 75:19 transcript 4:1,13 93:5 94:7,10 transcription 95:11 transitioning 79:14 transparent 82:2 treat 54:2,7 57:19 83:13 89:3 treated 62:21 77:5 treating 58:3 74:22 treatment 9:25 16:10 54:8 57:1 57:7,22 63:6 72:5 74:20 76:19 77:1,4 87:14 treatments 54:10 54:12 56:23 57:12 58:1,13,16 58:18 78:23 trial 90:1 trials 79:5 89:23 tributary 16:5,8 16:24 32:12,18 32:22,23 33:2 35:8 41:21 87:7 triggered 87:23 triggers 42:22 trihalomethane 35:24 36:2,6 37:9,20 38:15,22 40:11,20 41:2,3	44:5,13 45:9,12 45:15 48:9,20 50:5,9,10,16 51:3,13 52:9,13 53:6 54:3 55:3,6 55:8 56:11 63:8 65:20 66:15 69:21 70:15 81:17,19 90:17 trihalomethanes 35:18,22 36:19 37:1 38:12 41:13 41:14 42:11,19 43:15 44:8,22 45:20 46:20 47:16 48:17 49:1 49:9,12 54:7 55:10,13,18,23 57:20 58:3 60:2 60:4 61:2,13 62:5 65:1,16 67:2 69:15 70:11 71:10,15,23,24 72:5 90:21 trips 23:10 trucks 89:19 true 13:4 76:10 93:4 95:10 truly 82:3 try 32:4 74:6 trying 17:11 23:9 49:18 74:14 76:24 85:19 Tryon 2:13 4:7 TTHM 59:22 60:2 61:12 turning 59:24 turns 25:24 Twenty/fourteen 46:8 Twenty/twelve 42:14 twice 64:3 two 21:14 22:6 28:3 39:8,9,10
---	---	---	--	--

43:20 54:14 73:10 80:1 Two-thousand/... 70:6 type 11:8,11 36:23 57:22 types 50:17 67:1 70:14	78:15,19 use 47:6 83:13,24 84:11,13 94:12 users 47:4 57:18 81:23 82:5	30:1,5,9,13,16 31:7 33:10,25 34:8,12,13,22 35:16 36:14 37:2 37:19 38:13 39:1 39:14 40:18 41:3 41:23 42:2,10,18 43:11 44:4,20 45:8,11 46:4,5 47:4,6 48:10 49:4,7,17,21 50:3,5,21 51:4 52:1,17 53:20 54:3,8,23 55:1 57:17,20 58:4,7 58:8,12,15,25 59:16 60:7,14,24 61:13 62:4,15,16 62:19,21 63:2,5 66:6 68:22 72:6 72:12 77:3 78:10 79:8 81:9,13,23 82:5 83:7 86:16 86:19 89:3,5	went 7:25 20:9,22 21:4 57:7 West 2:4,9 WHEREOF 95:18 Williams 2:12 4:7 WINYAH 1:7 wish 94:8 witness 4:13 85:3 85:5 90:13 94:5 95:9,18 witnesses 7:7 word 34:25 39:2 work 64:10 79:3 89:8,11 worked 38:10,14 62:14 91:24 working 51:17 56:17,19 works 13:18 79:24 91:24 92:6 worse 50:14 wouldn't 6:7 31:15 48:20 wrong 30:19 WSRO 3:22 69:5 Wylie 18:21,22 26:21 43:21,23	82:19 89:24 91:13,16,23 92:8 years 46:12 61:14 yesterday 31:4 33:14 83:18
<hr/> U <hr/> ubiquitous 73:25 Uh-huh 7:4,15 12:8 16:23 32:15 39:12 44:19,21 62:13 64:7 69:13 90:6 ultimate 92:3 ultimately 14:5 15:11 21:9 UNC-Charlotte 79:3,11 underneath 62:11 understand 5:11 5:18,24 6:2,3,5 6:11 25:8 56:5 67:6,23 understanding 32:20 42:5 52:2 60:15 64:23 67:8 67:10 85:24 understood 85:8 Unfortunately 51:16 units 73:8 76:1,5,6 76:8 update 8:17 updated 8:11 upstream 15:16 15:24 16:15,16 16:17,25 17:2,23 18:25 19:1,2,15 19:16,21,21 33:2 33:11 34:9,14,23 35:10 49:16,21 50:2 77:22 78:5	<hr/> V <hr/> v 94:2 Vaguely 32:3 variance 23:20 various 41:3 47:5 vary 22:13 75:20 verbal 5:24 Verbatim 4:6 95:5 versions 9:9 versus 78:19 Virginia 25:21,23 VOICES 1:19 vs 1:6,10,18,23	66:6 68:22 72:6 72:12 77:3 78:10 79:8 81:9,13,23 82:5 83:7 86:16 86:19 89:3,5 Waterree 20:4 WATERKEEP... 1:7,22 waters 17:15 30:10,23,25 31:24 37:6 47:13 86:17,21 way 19:3 38:3 42:18 50:11,15 50:21 56:1 79:9 91:24 92:6 we'll 5:10 we're 5:21 14:15 14:19,19 22:21 44:14 67:9 76:22 79:6 weather 46:14,16 46:16 website 26:20 27:11,14 46:22 66:5	<hr/> X <hr/> x 3:1 70:9	<hr/> Z <hr/> ZACHARY 1:5 4:2 5:1 93:12 94:5 zero 66:17,20,21 79:14,18
	<hr/> W <hr/> walk 17:18 walked 17:21 want 33:19 58:10 80:20 89:19 wanted 35:4 warmer 36:14 wasn't 29:23 35:2 waste 53:22 79:4 79:25 80:5 89:3 89:4 wastewater 14:2 16:10 74:20 76:18 77:1,4 79:21 87:13 WATCH 1:9 water 3:8,17 7:17 9:25,25 11:6,7,8 11:24,25 12:5,6 12:12,20 14:4 15:6,17 18:2,15 18:18 25:11 26:1 26:6,9,13,16 27:17,23 28:8 29:1,10,21,22,24	<hr/> Y <hr/> YADKIN 1:19 yeah 8:22 17:10 19:2,9,16 20:14 21:18 22:4 25:15 27:10,24 32:25 39:25 42:5 43:7 67:18,20 74:10 75:15,18 76:8 86:14 90:9 91:11 year 21:5 42:24 46:12 59:16 60:5 64:1,2,3 79:7	<hr/> 0 <hr/> 0.06 66:22 08 53:24	<hr/> 1 <hr/> 1 3:4,8 6:18,21 7:11 28:2,5 46:20 59:8,10 93:2 10 1:7 16:3 87:11 10/25/16 3:12 100 78:7 101 2:13 4:7 10th 4:8 11 87:11 110 78:7 86:8 114 2:9 12 22:7 12/6/11 3:22 12:15 92:15 13 69:2 13-CVS-11032 1:2 94:4 13-CVS-14461 94:4 13-CVS-14661 1:14 15 7:8,10,16 16:4 31:5 17th 95:19 19942760095 95:24

2	3	48:3,14 71:14		
2 3:6,11 6:23,25	3 3:16 66:3,10	85 2:19,21		
7:3 28:7 48:16	69:11,14	86 61:8		
63:13,14,15	30 77:25 78:12,15	87 61:9		
71:18 72:10	94:15	89 61:9		
20 45:4 73:14	30(b)(6) 6:12			
77:25 78:5,12,15	316(a) 23:19	9		
86:17	33 62:2	9 66:9,13		
2006 71:11,14	34 62:2	9:36 1:7 4:9		
2007 29:7	3500 2:12 4:8	90 2:21,23 78:7		
2008 70:1,4	38 62:2	86:8 87:2		
2009 70:2,21,25		919-716-6600 2:10		
71:4,23	4	919-967-1450 2:5		
2010- 39:20	4 3:19 7:14 68:6	92 2:23 93:2		
2011 21:22 42:14	68:11,12,16,20	95 87:18		
45:1 51:6 69:2	68:21			
71:11,18 88:2	47 62:8			
2011-2012 17:12				
2012 11:22 21:22	5			
38:8 43:8 45:1,5	5 2:19 3:21 59:25			
51:6,9 53:3	68:5,9,11,12			
56:20 88:16	69:7,10			
2013 73:13	50 62:9 78:2 86:2			
2014 10:21 46:10	55 62:9			
2014-2015 47:9	56 62:8			
2015 3:8 8:15	57 62:8,8			
10:22 11:16	59 3:8			
20:15 21:25				
46:10,10 48:11	6			
59:16 60:5 61:5	6 3:4,6			
73:19 82:13,17	60 55:17 78:3,17			
82:18 85:18	86:2			
2016 20:22 63:19	601 2:4			
91:17	629 2:8			
2017 1:7 4:9 89:25	63 3:11			
91:13 93:14	66 3:16			
95:19	68 3:19,21			
2018 91:15				
22 73:14	7			
220 2:4	704-378-4783 2:14			
25 78:5	75 48:14			
27516 2:4	750,000 72:9			
27602 2:9				
28230 2:13	8			
	80 41:16 42:23			